



## Workshop Manual

Fox 2004 ►

Fox 2010 ►

Fox 2014 ►

SpaceFox 2011 ►

Running gear, axles, steering

Edition 10.2018

1



## List of Workshop Manual Repair Groups

### Repair Group

- 00 - Technical data
- 40 - Front suspension
- 42 - Rear suspension
- 44 - Wheels, tyres, vehicle geometry
- 48 - Steering



Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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## 00 – Technical data

### 1 Assessment of crashed vehicles

(VRL012322; Edition 10.2018)

In work to repair steering wheel and suspension components in crashed vehicles, there may be unidentified damage to the chassis. These unidentified damages may later cause serious consequences. If the vehicle geometry measurement does not indicate any differences in relation to the nominal values, this means that there is no deformation in the chassis. Regardless of checking the vehicle geometry, the following components are checked on the sequence and as indicated.

Visual check of the steering system's functioning:

- ◆ Check visually for deformities and cracks
- ◆ Check clearances in the track rod joint and in the steering mechanism
- ◆ Check electrical wires, hydraulic system tubes, and flexible tubes for wear, cuts, or folds
- ◆ Check the air-tightness of hydraulic system tubes, threaded units and steering box
- ◆ Check the correct seating of the steering box and the tubes
- ◆ Check the correct operation of the steering system, making the steering wheel travel all the way, from stop to stop. Applying the same force, the steering wheel should turn with no pressure

Visual check of the chassis operation:

- ◆ Check all components in the assembly diagram for deformations, cracks, or other damage
- ◆ Always replace the damaged components
- ◆ Check the vehicle's geometry using equipment certified by "VOLKSWAGEN"

Visual check of wheel and tyre operation:

- ◆ Check for uniformity and any deformations. See: ➤ Chassis, axles, steering; Rep. gr. 44 ; Vehicle wheels, tires, measurement
- ◆ Check the tires for cuts and damages to profile and sides. See: ➤ Chassis, axles, steering; Rep. gr. 44 ; Vehicle wheels, tires, measurement
- ◆ Check the correct tire pressure; tire pressure (see tag on fuel lid) or in the manual ➤ Maintenance ; Booklet

In case of damage to the rim and/or tire, replace the tire. The same applies when the crash and damages to the vehicle indicate rim damage, even if not visible.

Another decision criterion is the age of the tyres: tyres must not be over 6 years old.

In case of doubt:

- If a safety risk cannot be eliminated, the tire(s) must be replaced

Overall vehicle condition:

Also check other vehicle systems, such as:



- ◆ Braking system, including ABS
- ◆ Exhaust and protection system for passengers through visual and operation checking

Checking and adjustment values, and notes on the issue are included in the respective Repair Manual/ELSA.

The check described herein, related to crashed vehicles, refers only to the running gear and is not intended to be comprehensive for the entire vehicle.

#### Vehicle electronic systems:

Refer to the Vehicle diagnostic, testing and information system - VAS 5051- or later equipment ➤ General information; Rep. gr. 97 ; Electrical harnesses and cables for information on the relevant safety systems, such as ABS, Airbag, steering systems with electronic adjustment, electromechanical and electric-hydraulic power steering and driver assistance systems and other systems, if any, for eventual damages. If there are any inconsistencies in the fault memory of these systems, proceed with the repairs according to the instructions in the Repair Manual or from ELSA. When repairs have been completed, check the systems again for any damages, ensuring the correct operation of the respective device.





## 2 General guidelines

The information regarding wheels and tires is located in ⇒ Chassis, axles, steering; Rep. gr. 44 ; Vehicle wheels, tires, measurement .





### 3 Technical data

#### 3.1 Running gear

Model		Fox (5Z1)	Crossfox (5Z1)	Fox (5Z3)	Crossfox (5Z3)	Spacefox / Suran (5Z7)	Spacefox Cross / Suran Cross (5Z7)
Wheelbase	m	2464	2469	2465	2468	2465	2469
Unloaded axle gauge	m	1418 front 1408 rear	1446 front 1419 rear	1425 front 1422 rear	1445 front 1430 rear	1425 front 1422 rear	1448 front 1435 rear
Vehicle turning diameter	m						
Mechanical steering box		11.04	---	9.9	---	---	---
Power steering box		11.2	11.2	11.2	11.2	11.2	11.2

#### 3.2 Steering

Model	All	
Steering box	Mechanical steering	Power steering
Steering wheel turns from stop to stop	4.01	2.90



## 40 – Front suspension

### 1 Assessment of crashed vehicles

See checklist for assessment of the chassis of crashed vehicles  
⇒ [page 1](#).





## 2 Front suspension (►04/13) - repair

### 2.1 Front suspension (►04/13) - assembly overview



#### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
⇒ [page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Soldering and straightening operations are not permitted on the suspension supporting components or on those components in which the wheels are mounted
- ◆ Always replace corroded or rusted screws/nuts



#### Note

When replacing components with metal and rubber supports, or when bolts/nuts have been removed from such components, you must lift the unloaded axle before tightening ⇒ [page 8](#).



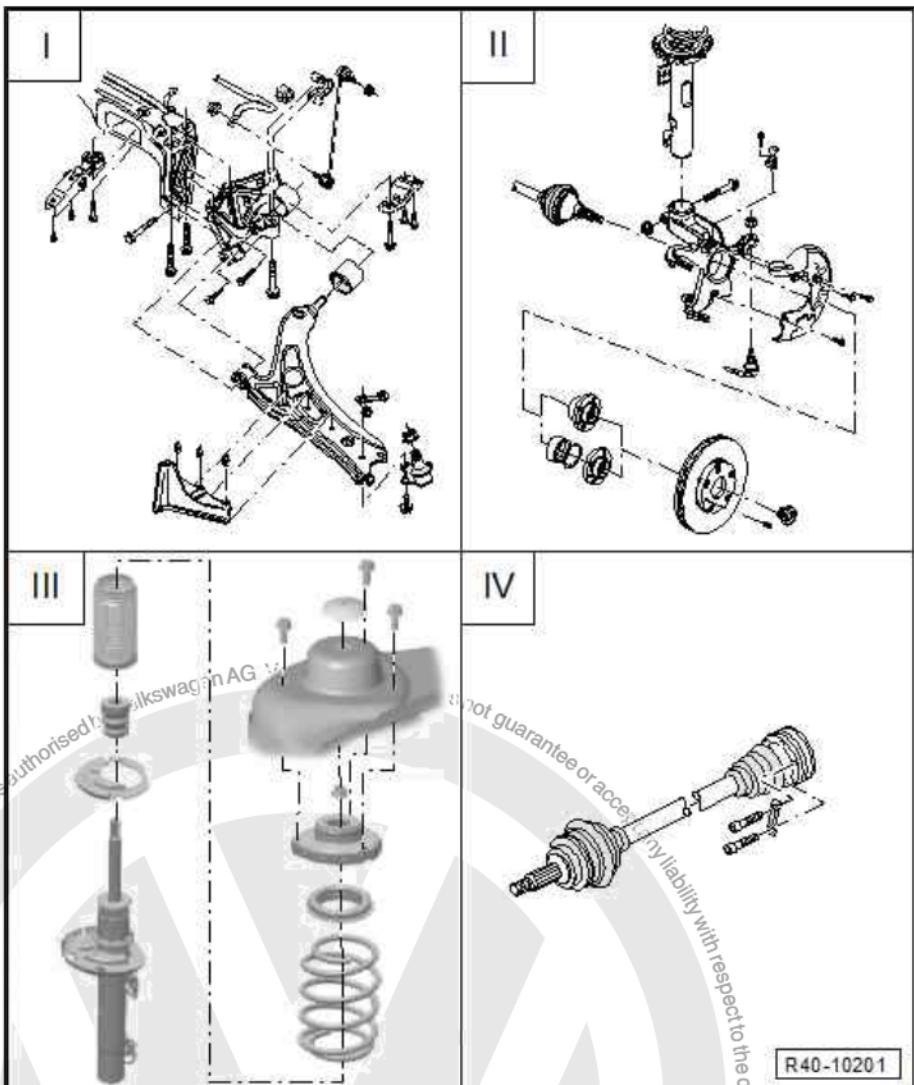


I - Auxiliary frame (sub-frame),  
 anti-roll bar, wishbones - repair  
[⇒ page 16](#)

II - Wheel roller bearings - re-  
 pair [⇒ page 71](#)

III - Front suspension column -  
 repair [⇒ page 115](#)

IV - Constant velocity joint  
 drive shaft - repair  
[⇒ page 155](#)

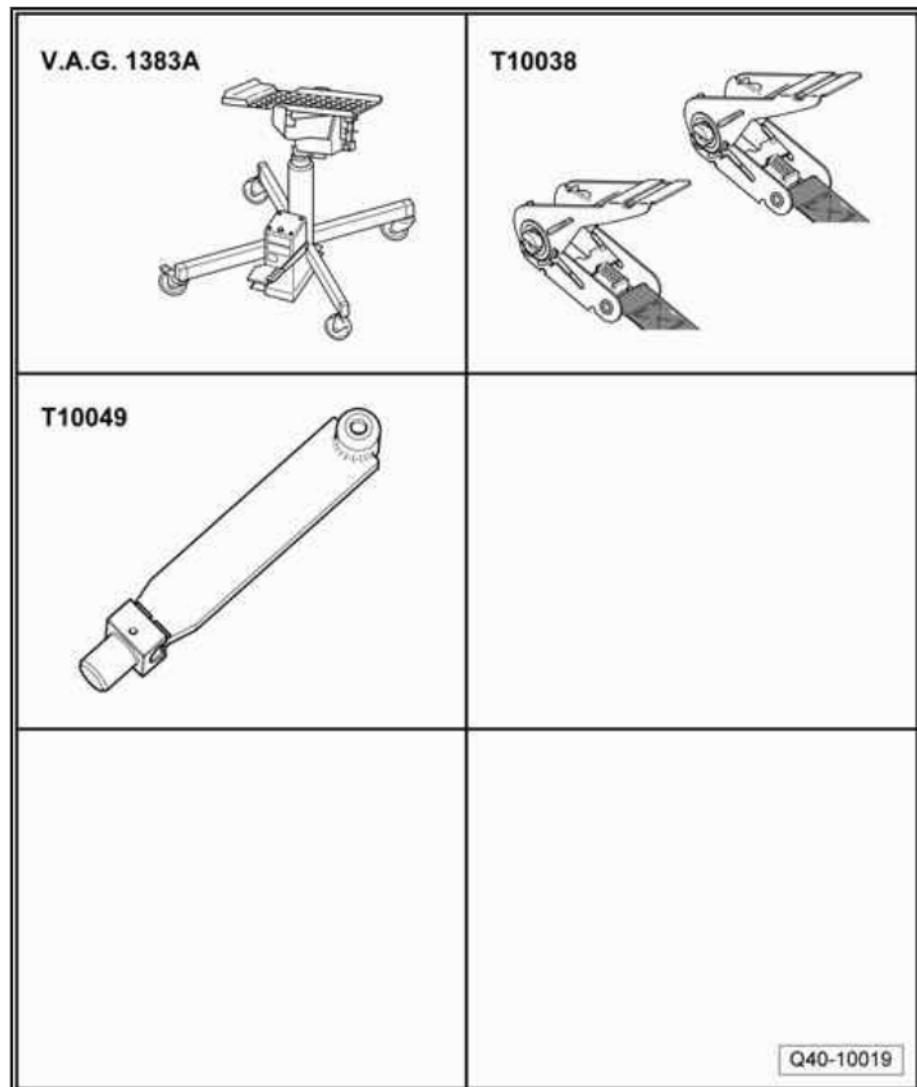




The chapter "Drive shafts with constant velocity joint - remove and install" is found [⇒ page 138](#)

## 2.2 Raise the front axle under unloaded conditions

Special tools and workshop equipment required



- ◆ Gearbox jack or gearbox + engine set or EQ 7081 - VAG 1383A-
- ◆ Tensioning strap - T10038-
- ◆ Mounting bracket - T10149-

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## WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
⇒ page 204
- ◆ All chassis component bolts using metal rubber bearings must always be tightened with the vehicle unloaded (empty).
- ◆ The metal-rubber bearings torsion is limited. Therefore, axle components with metal/rubber bearings must be placed in the corresponding operating position with the vehicle unloaded (empty) before tightening.
- ◆ Otherwise, the metal-rubber bearings would deform and their useful life consequently be reduced.

This position can be simulated on the lift with the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and the Support - T10149-.

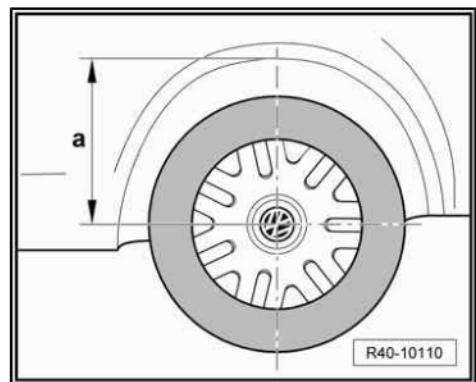
Before beginning work, use a measuring tape to measure the distance  $a$  from the centre of the wheel to the lower edge of the wheel arch.



## Note

- ◆ *Measurement must be made with the vehicle unloaded.*
- ◆ *Write down the reading. This will be required for the subsequent tightening of bolts/nuts.*

Before raising the vehicle, fasten it to the lift's wishbones by using the Tension belt - T10038 - ⇒ Maintenance ; Booklet 22.1: Service descriptions, lifting the vehicle .



## Caution

*If the vehicle is incorrectly secured, there is a risk it may fall off the lift!*

- Turn the wheel hub until the wheel bolt holes are positioned on top.
- Fasten the Support - T10149- to the wheel hub with the wheel bolt.



Any necessary bolts and nuts may only be tightened when the distance -a- between the wheel hub and the lower corner of wheel arch is the same as previously measured.

Measurement -a- depends on the specific suspension installed:

Front suspension 1)	Altitude -a- in mm
Conventional suspension (G01)	411 ± 10 mm
Conventional suspension (G01) (GP1)	409 ± 10 mm
Comfort suspension (G14)	387 ± 10 mm
Comfort suspension (G14) (GP1)	380 ± 10 mm
Comfort suspension (G09, G15, G16)	397 ± 10 mm
Conventional suspension (G23, G25)	397 ± 10 mm
Comfort suspension (G17)	420 ± 10 mm
Comfort suspension (G17, G28) (GP1)	413 ± 10 mm
Conventional suspension (G22) (GP1)	387 ± 10 mm
Comfort suspension (G10) (EU)	377 ± 10 mm
Conventional suspension (G26) (EU)	377 ± 10 mm
Comfort suspension (G18) (GP1)	387 ± 10 mm
Comfort suspension (G19) (Bluemotion/GP1)	387 ± 10 mm
Conventional suspension (G18, G19, G27) (GP2)	380 ± 10 mm

1) The suspension installed in the vehicle's front axle is identified in the identification tag with the corresponding PR number. Explanations related to the PR numbers, refer to [⇒ page 206](#)

Procedure for lifting the rear axle with vehicle unloaded, refer to [⇒ page 168](#).

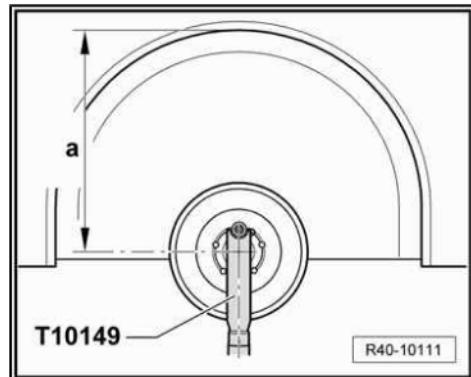
- Lift the front axle using the Gearbox jack or combined engine/gearbox jack or EQ 7081 - VAG 1383A- until reaching measurement -a-.



#### WARNING

- ◆ *Do not lift or lower the vehicle if the Gearbox jack or combined engine/gearbox jack or EQ 7081 - VAG 1383A- is under the vehicle.*
- ◆ *Do not leave the Gearbox or engine/gearbox jack or EQ 7081 - VAG 1383A- under the vehicle for longer than necessary.*

- Tighten the union nuts and bolts.
- Remove the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- from underneath the vehicle.
- Remove the Support - T10149- .





### 3 Front suspension (04/13►) - repair

#### 3.1 Front suspension (04/13►) - assembly overview



##### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
⇒ [page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Soldering and straightening operations are not permitted on the suspension supporting components or on those components in which the wheels are mounted
- ◆ Always replace corroded or rusted screws/nuts



##### Note

When replacing components with metal and rubber supports, or when bolts/nuts have been removed from such components, you must lift the unloaded axle before tightening ⇒ [page 8](#).

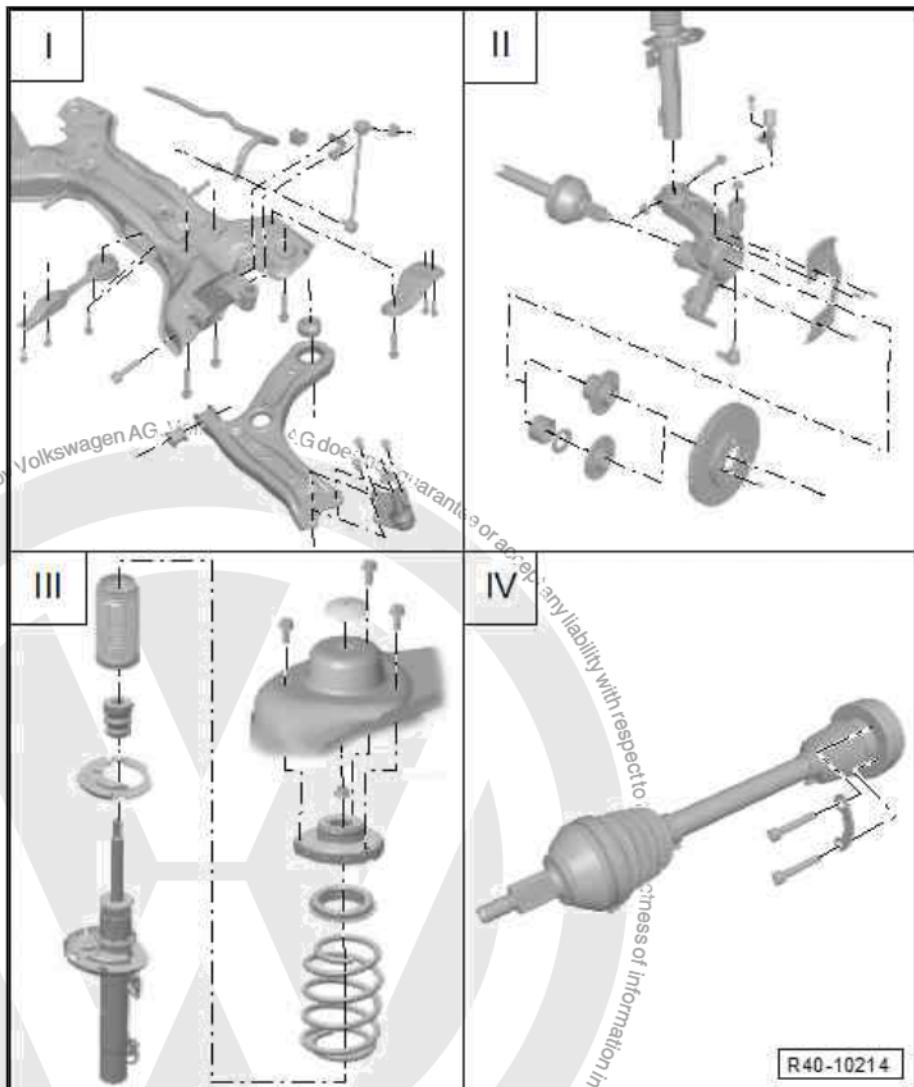


I - Auxiliary frame (sub-frame),  
anti-roll bar, wishbones - repair  
⇒ [page 45](#)

II - Wheel roller bearings - re-  
pair ⇒ [page 93](#)

III - Front suspension column -  
repair ⇒ [page 125](#)

IV - Constant velocity joint  
drive shaft - repair  
⇒ [page 155](#)



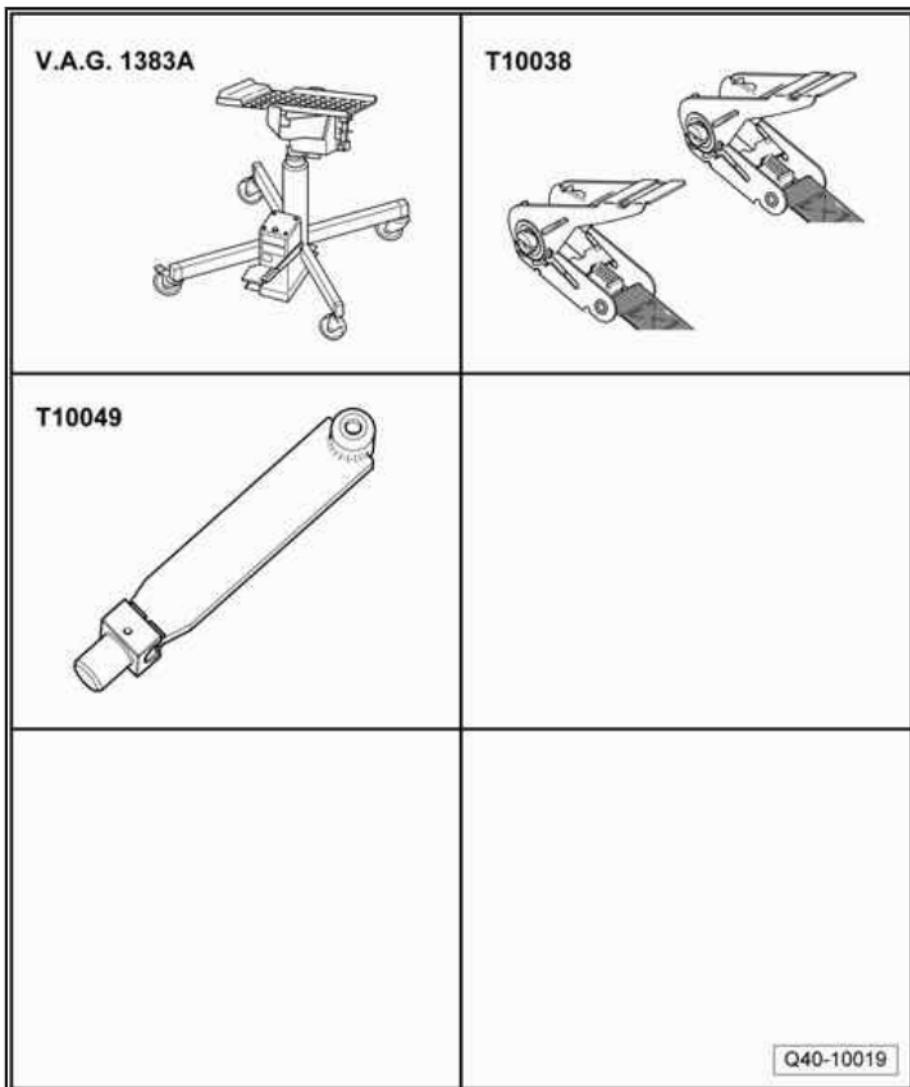
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The chapter "Drive shafts with constant velocity joint - remove and install" is found [⇒ page 145](#)

### 3.2 Raise the front axle under unloaded conditions

Special tools and workshop equipment required



- ◆ Gearbox jack or gearbox + engine set or EQ 7081 - VAG 1383A-
- ◆ Tensioning strap - T10038-
- ◆ Mounting bracket - T10149-



### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
⇒ [page 204](#)
- ◆ All chassis component bolts using metal rubber bearings must always be tightened with the vehicle unloaded (empty).
- ◆ The metal-rubber bearings torsion is limited. Therefore, axle components with metal/rubber bearings must be placed in the corresponding operating position with the vehicle unloaded (empty) before tightening.
- ◆ Otherwise, the metal-rubber bearings would deform and their useful life consequently be reduced.

This position can be simulated on the lift with the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and the Support - T10149- .

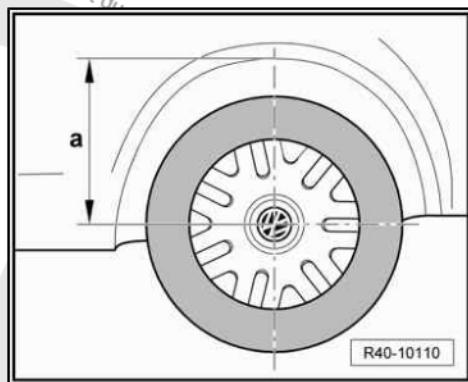
Before beginning work, use a measuring tape to measure the distance -a- from the centre of the wheel to the lower edge of the wheel arch.



### Note

- ◆ Measurement must be made with the vehicle unloaded.
- ◆ Write down the reading. This will be required for the subsequent tightening of bolts/nuts.

Before raising the vehicle, fasten it to the lift's wishbones by using the Tension belt - T10038- ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle .



### Caution

*If the vehicle is incorrectly secured, there is a risk it may fall off the lift!*

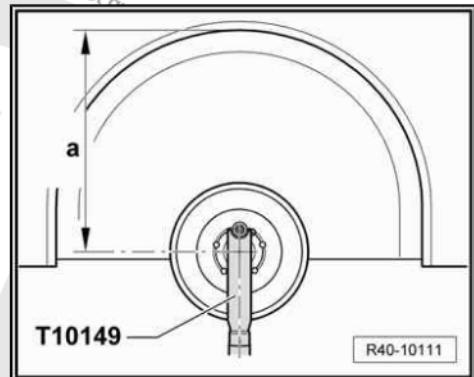
- Turn the wheel hub until the wheel bolt holes are positioned on top.
- Fasten the Support - T10149- to the wheel hub with the wheel bolt.



Any necessary bolts and nuts may only be tightened when the distance -a- between the wheel hub and the lower corner of wheel arch is the same as previously measured.

Measurement -a- depends on the specific suspension installed:

Front suspension 1)	Altitude -a- in mm
Conventional suspension (G01)	411 ± 10 mm
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Comfort suspension (G09, G15, G16)	397 ± 10 mm
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Comfort suspension (G17)	420 ± 10 mm
Comfort suspension (G17, G28) (GP1)	413 ± 10 mm
Conventional suspension (G22) (GP1)	387 ± 10 mm
Comfort suspension (G10) (EU)	377 ± 10 mm
Conventional suspension (G26) (EU)	377 ± 10 mm
Comfort suspension (G18) (GP1)	387 ± 10 mm
Comfort suspension (G19) (Bluemotion/GP1)	387 ± 10 mm
Conventional suspension (G18, G19, G27) (GP2)	380 ± 10 mm



2) The suspension installed in the vehicle's front axle is identified in the identification tag with the corresponding PR number. Explanations related to the PR numbers, refer to [⇒ page 206](#)

Procedure for lifting the rear axle with vehicle unloaded, refer to [⇒ page 168](#).

- Lift the front axle using the Gearbox jack or combined engine/gearbox jack or EQ 7081 - VAG 1383A- until reaching measurement -a-.



#### WARNING

- ◆ *Do not lift or lower the vehicle if the Gearbox jack or combined engine/gearbox jack or EQ 7081 - VAG 1383A- is under the vehicle.*
- ◆ *Do not leave the Gearbox or engine/gearbox jack or EQ 7081 - VAG 1383A- under the vehicle for longer than necessary.*

- Tighten the union nuts and bolts.
- Remove the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- from underneath the vehicle.
- Remove the Support - T10149- .



4 I - Auxiliary frame (assembly mounting) , anti-roll bar, wishbones  
(►04/13) - repair

4.1 Auxiliary frame (assembly mounting),  
anti-roll bar, wishbones (►04/13) - assembly overview



**WARNING**

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
[⇒ page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Soldering and straightening operations are not permitted on the suspension supporting components or on those components in which the wheels are mounted
- ◆ Always replace corroded bolts/nuts



**Note**

When replacing components with metal and rubber supports, or when screws/nuts have been removed from such components, you must lift the unloaded axle before tightening [⇒ page 8](#)



1 - Auxiliary frame (assembly mounting)

- different versions
- See: ⇒ Electronic Parts Catalogue "ETKA"
- Remove and install [⇒ page 35](#)

2 - Hexagonal nut

- Self-locking
- 40 Nm
- Replace once removed

3 - Anti-roll bar

The auxiliary frame (assembly mounting) must be lowered to remove/install the anti-roll bar

- Remove and install [⇒ page 41](#)

4 - Rubber support

- Always replace both sides
- See: ⇒ Electronic parts catalogue "ETKA"
- To remove it, the securing bolts between the clamp and the rubber support

5 - Clamp

6 - Hexagonal nut

- Self-locking
- 40 Nm
- Replace once removed

7 - Coupling rod

- Tighten the locknut upon aligning the vehicle
- Only for vehicles with anti-roll bar
- Between anti-roll bar and suspension strut

8 - Console of the auxiliary frame (sub-frame)

- Remove and install [⇒ page 29](#)

If the console thread is damaged, it can be repaired with a Heli-Coil thread insert

Repair the thread in the longitudinal member [⇒ page 19](#)

9 - Mounting bracket

10 - Hexagon socket head bolt

- 20 Nm + 90°
- Replace once removed

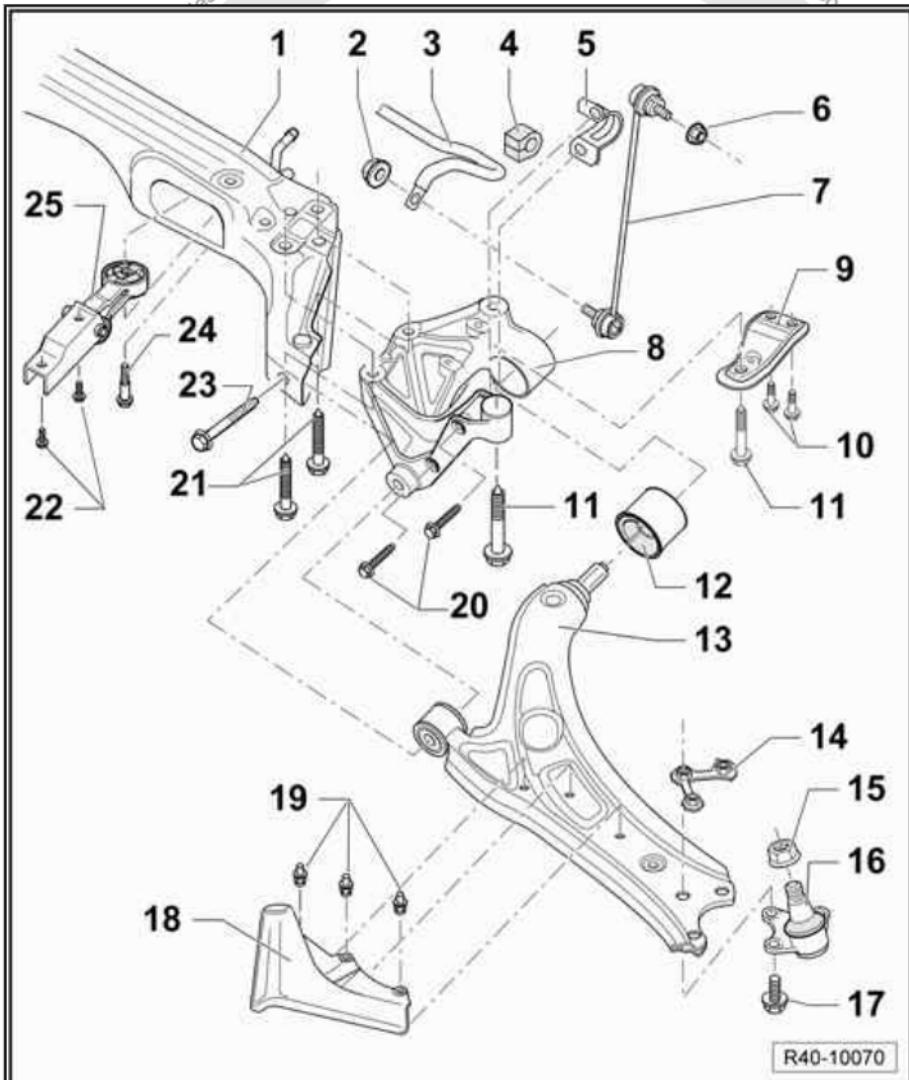
If the soldered nut thread is damaged, it can be repaired with a Heli-Coil thread insert

Repair the thread in the longitudinal member [⇒ page 19](#)

11 - Hexagonal bolt

- 70 Nm + 90°
- Replace once removed

If the soldered nut thread is damaged, it can be repaired with a Heli-Coil thread insert



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Repair the thread in the longitudinal member [⇒ page 19](#)

12 - Rubber support bearing for the console

- different versions
- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install [⇒ page 31](#)

13 - Wishbone (transversal)

- Remove and install [⇒ page 24](#)

14 - Plate with nuts

15 - Hexagonal nut

- Self-locking
- 20 Nm + 90°
- Replace once removed

16 - Swivel guide

- Check [⇒ page 19](#)
- Remove and install [⇒ page 19](#)
- Installation position [⇒ page 24](#)

17 - Hexagonal bolt

- 20 Nm + 90°
- Replace once removed

18 - Air deflector plate

- Only on vehicles with 13" wheel running gear (FS-II brake caliper)

19 - Spreader rivet

- Only on vehicles with 13" wheel running gear (FS-II brake caliper)

20 - Hexagon socket head bolt

- 20 Nm + 90°
- Replace once removed

21 - Hexagonal bolt

- 50 Nm + 90°
- Replace once removed

follow the sequence for installing and tightening the screws:

- ◆ First, tighten the hexagonal bolt -position 23-, but do not tighten it definitively yet
- ◆ Next, tighten the hexagonal bolt -position 21-, but do not tighten it definitively.
- ◆ Finally, tighten the hexagonal screws alternately

22 - Hexagonal bolt

- 30 Nm + 90°
- Replace once removed

23 - Hexagonal bolt

- 70 Nm + 90°
- Replace once removed

follow the sequence for installing and tightening the screws:

- ◆ First, tighten the hexagonal bolt -position 23-, but do not tighten it definitively yet
- ◆ Next, tighten the hexagonal bolt -position 21-, but do not tighten it definitively
- ◆ Finally, tighten the hexagonal screws alternately

24 - Hexagonal bolt

- 40 Nm + 90°
- Replace once removed



## 25 - Pendulum support

### 4.2 Thread in longitudinal member - repair

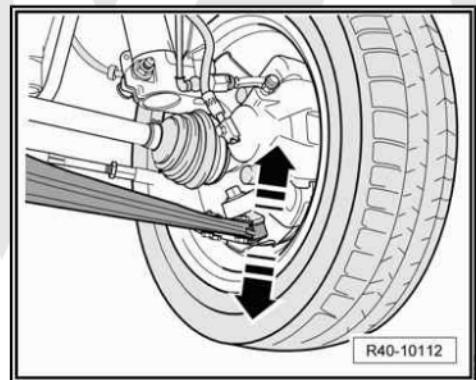
Repairing the thread of nuts welded onto the car body is possible under certain circumstances, refer to ⇒ Body Repairs, Rep. gr. 50.

### 4.3 Swivel joint - check for clearance

Check axial clearance:

- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Forcibly pull down the wishbone -direction of the arrow- and press it up again.

Check radial clearance:

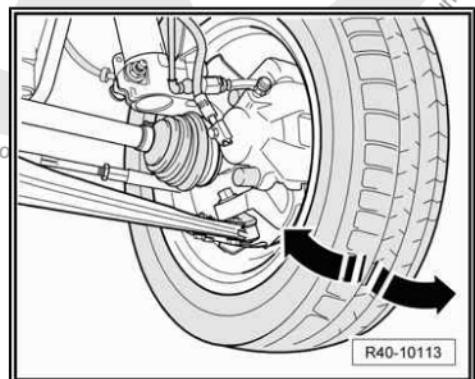


- Straighten the wheels/steering wheel.
- Press the lower section of the wheel forcefully outwards and inwards -direction of the arrow-.
- Turn the wheels/steering wheel to the left and repeat verification.
- Turn the wheels/steering wheel to the right and repeat verification.



#### Note

- ◆ There should be no perceptible or visible "gap" during either check.
- ◆ Observe the swivel joint during the check
- ◆ Consider an eventual "clearance" in the wheel roller bearing or in the upper support of the suspension strut
- ◆ Check the rubber boot for damages, replace the swivel joint, if necessary



### 4.4 Swivel guide (►04/13) - remove and install

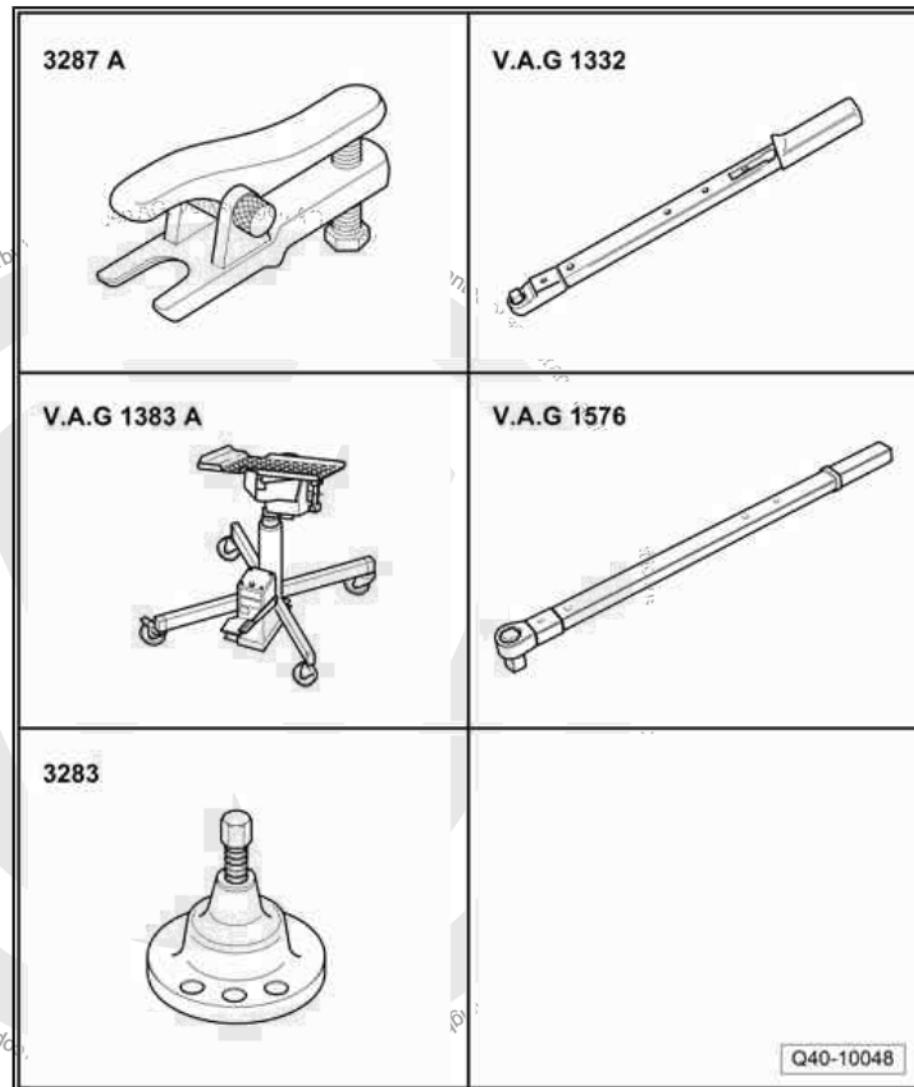


#### WARNING

Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)



Special tools and workshop equipment required



- ◆ Puller - 3287A-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ "Torque wrench - 75 to 400 Nm (fit. 3/4" drive) - VAG 1576-
- ◆ Puller - 3283-

#### 4.4.1 Removal



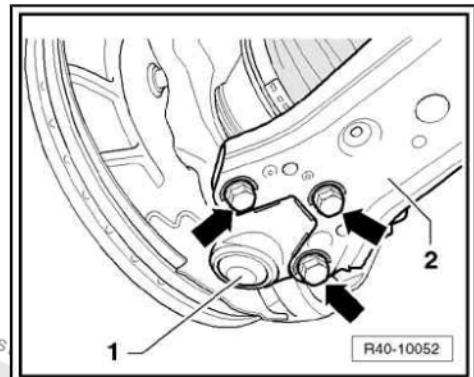
##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Loosen the fastening nut (dodecahedron) from the drive shaft [⇒ page 135](#) .
- Remove the respective wheel.

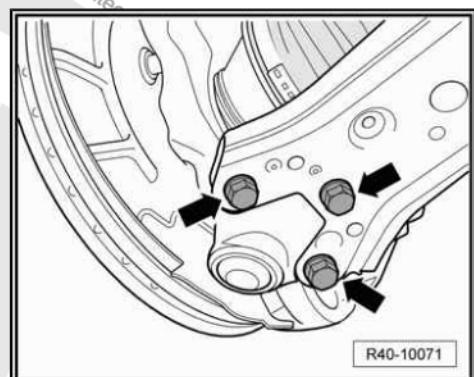


- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



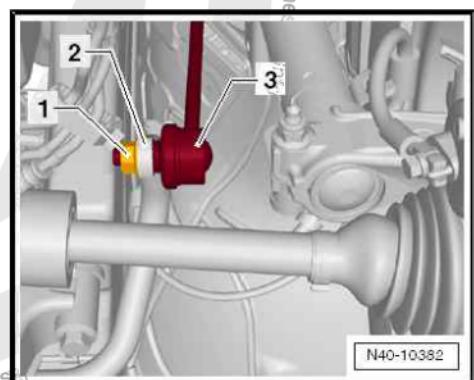
- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:

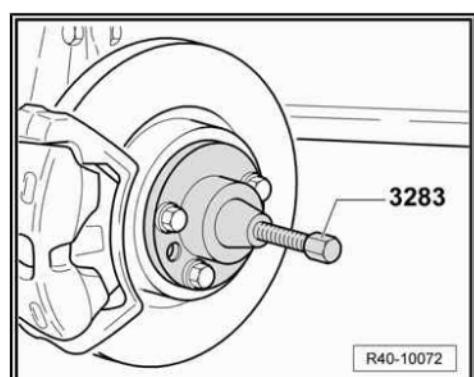


- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



Note

*While the drive shaft is being pressed outwards, observe if there is enough free space.*



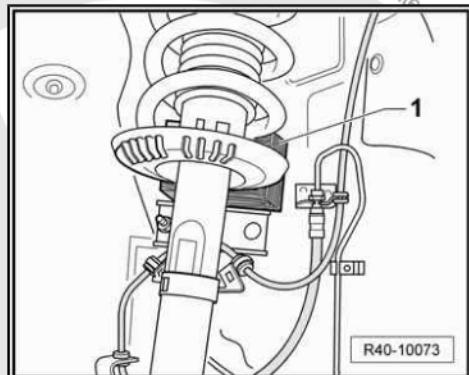


- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



Note

*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*

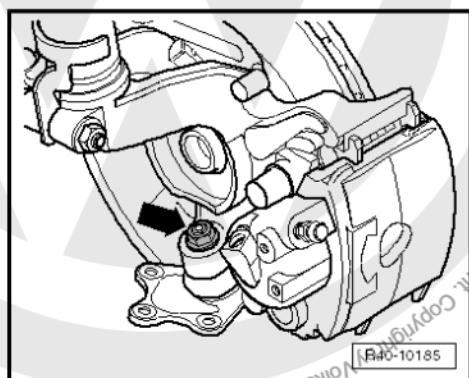


- Loosen the hexagonal union nut -arrow- on the swivel guide.



**WARNING**

*To protect the thread, leave the nut screwed a few turns at swivel joint.*



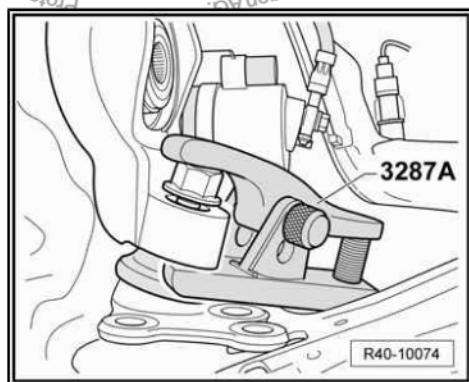
- Position the Puller - 3287A- as shown in illustration and press the swivel joint out.



Note

*Position the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-, or something similar (danger of accidents due to parts that may fall when the axle joint is removed).*

- Remove swivel guide.



#### 4.4.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



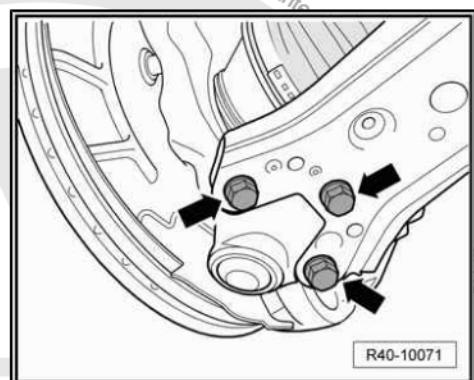
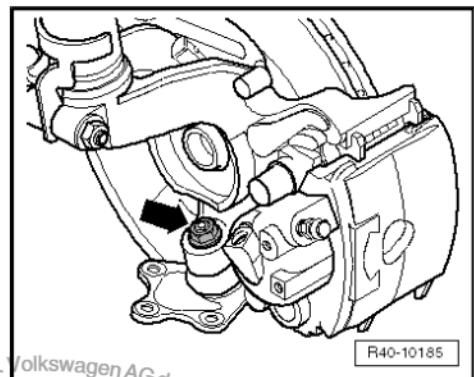
**WARNING**

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

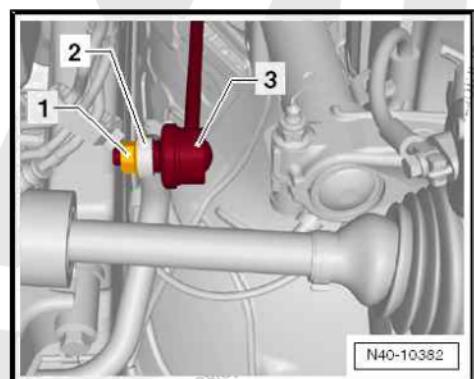
*Replace self-locking nuts and bolts subject to angular torque.*



- Install the swivel joint on the wheel roller bearing case.
- Tighten the self-locking nuts -arrow-, holding the bolt with the Torx T40 wrench. Tightening torque, see [page 23](#).
- To install the drive shaft on the wheel roller bearing case, refer to:
  - ◆ For vehicles without ABS [page 142](#)
  - ◆ For vehicles with ABS (FS II brake calipers - 13" wheel running gear) [page 142](#)
  - ◆ For vehicles with ABS (FS III brake calipers - 14" and 15" wheels running gear) [page 143](#)
- Insert the swivel joint in the wishbone.
- Install the fastening screws -arrows- (screws on the old markings) for the wishbone swivel guide. Tightening torque, see [page 23](#).



- Install the coupling rod -3- on the anti-roll bar -2-, on both sides. Tightening torque, see [page 23](#).
- Install the front wheel and tighten the screws. Tightening torque, see [page 203](#).
- Install and tighten the securing nut (dodecahedron). Tightening torque, see [page 135](#).



#### Tightening torques

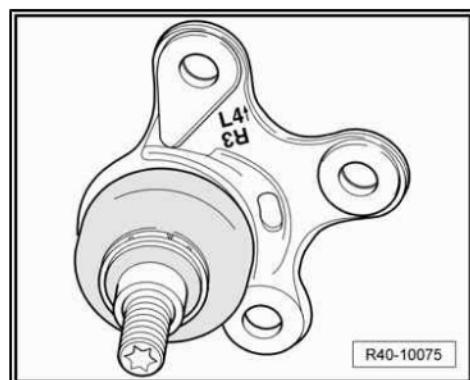
Components	Tightening torque
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm
Swivel joint to wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°



## 4.5 Swivel guides - installation position

### Left swivel joint

The arrow marked "L4" points in the vehicle travelling direction for the 14" wheel running gear (FS III brake calipers)



R40-10075

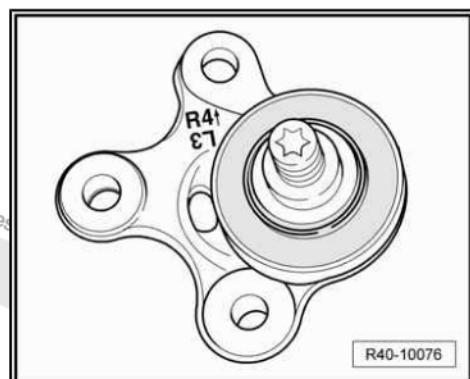
### Right swivel joint

The arrow marked "R4" points in the vehicle travelling direction for the 14" wheel running gear (FS III brake calipers)



#### Note

*Carefully check the position for installing the swivel guides, as the caster will be wrong if the inclination position is incorrect.*



R40-10076

## 4.6 Wishbone (transversal) (►04/13) - remove and install

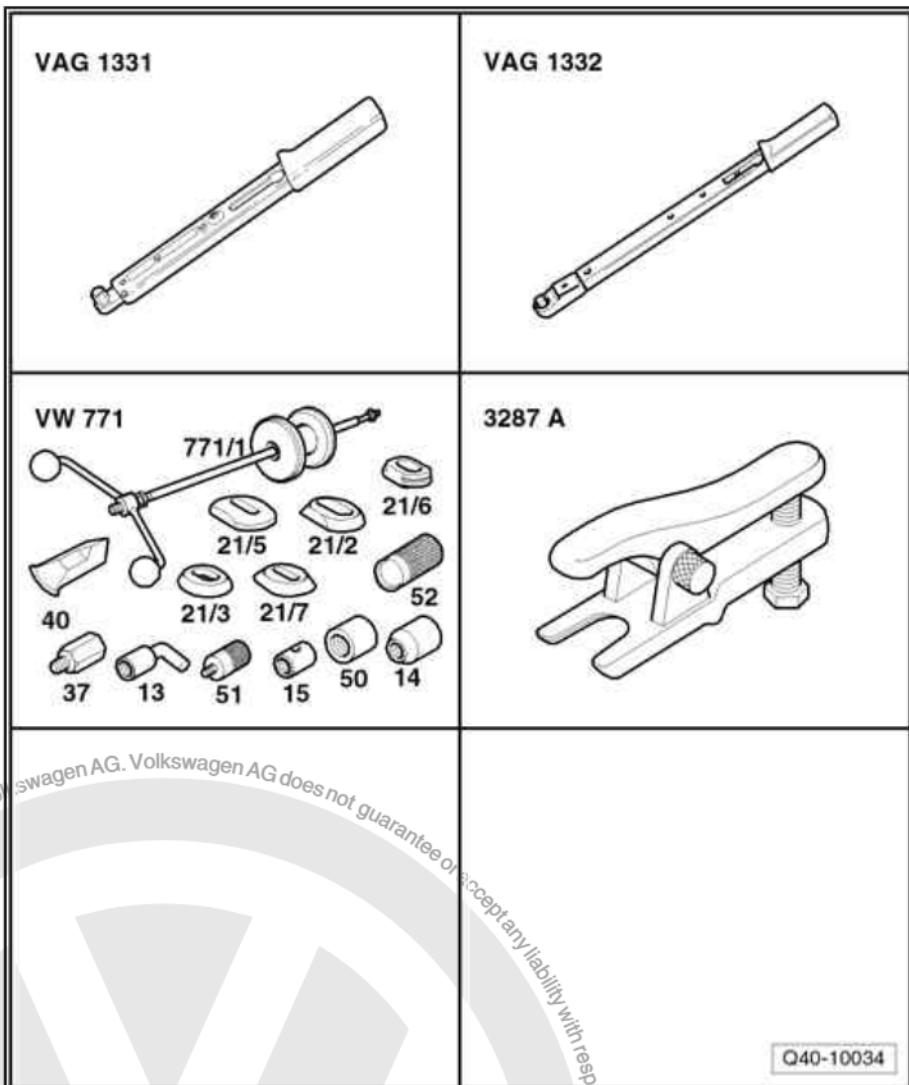


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [► page 204](#)*



Special tools and workshop equipment required



- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Bush and roller bearing puller - VW 771-
- ◆ Puller - 3287A-

#### 4.6.1 Removal



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Raise the vehicle ⇒ Maintenance Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the respective front wheel.

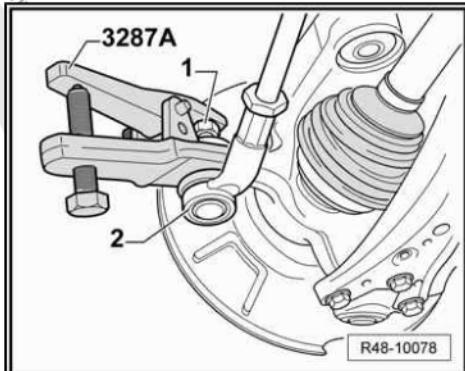


- Loosen the hexagonal nut -1- from the steering terminal.



**WARNING**

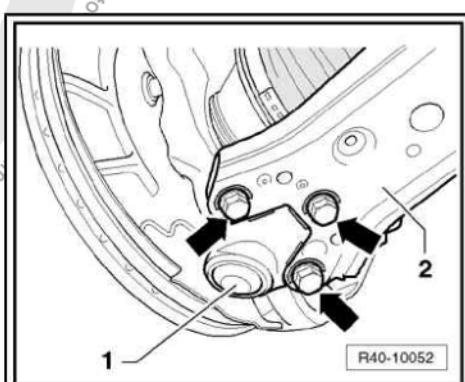
*To protect the thread, leave the nut screwed a few turns at the steering terminal.*



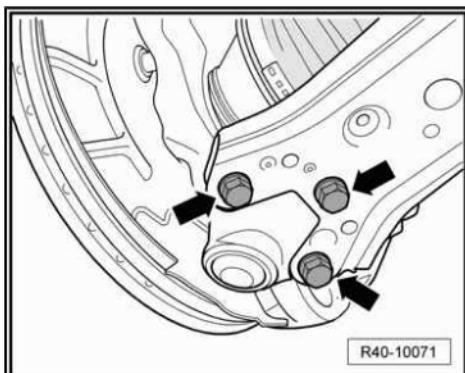
- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .

If replacing the wishbone is not necessary:

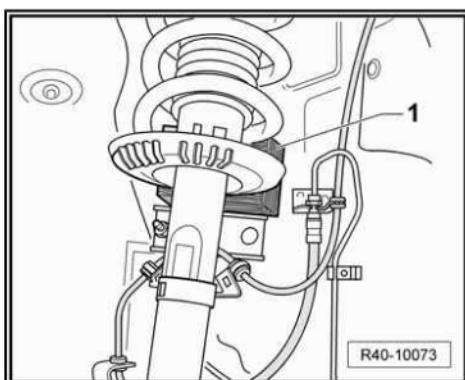
- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

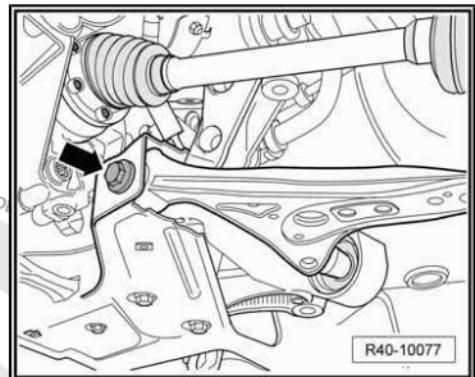


- Pull the suspension strut out and support it using a wood block -1- (for example).

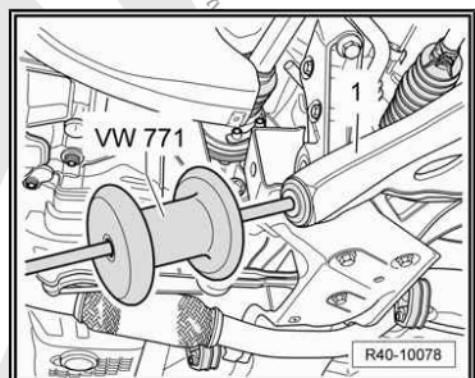




- Mark the assembly position of the fastening screw -arrow-.
- Remove the fastening screw -arrow- and remove the wishbone from the auxiliary frame.



- Remove the wishbone -1- from the console with the Bush and roller bearing puller - VW 771- .



## 4.6.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



### WARNING

*Replace self-locking nuts and bolts subject to angular torque*

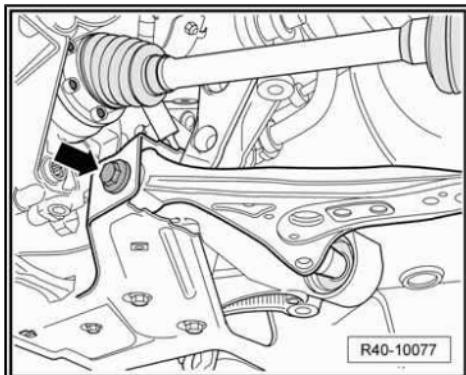
- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
⇒ page 204
- ◆ When installing, pay attention to the wishbone assembly position in relation to the console. The wishbone hexagonal end must match the metal-rubber support in the console
- ◆ The wishbone must be at the same level as the auxiliary frame (sub-frame)
- ◆ If the assembly position is not followed, the console metal-rubber bearing may be damaged, consequently reducing its durability

- Fit the wishbone to the console, using a rubber hammer if necessary.



- Install and tighten the fastening screw -arrow-. Tightening torque, see [page 28](#).
- Insert the swivel joint in the wishbone.
- If the wishbone is not replaced, install the fastening bolts (bolts with old markings) for the wishbone swivel guide. Tightening torque, see [page 28](#).

If the wishbone is replaced:



- Position the wishbone -1- and the swivel guide -2- so as to align their respective holes -arrows-.

For improved bore locating, use two punctures with a  $\varnothing$  of 8,3 mm or, as represented in the image and two drills with a  $\varnothing$  of 8,3 mm.

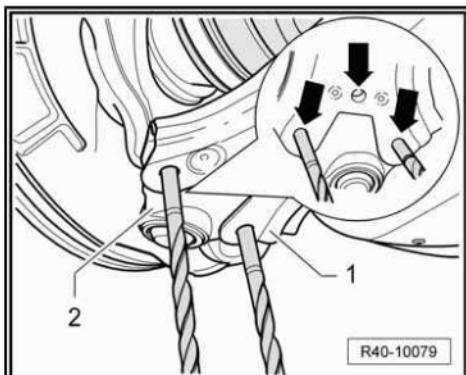
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see [page 28](#).

The remainder of the installation is performed in reverse sequence to the removal, considering the following:



#### WARNING

*Tighten the fastening bolts and nuts of the wishbone with the auxiliary frame (assembly mounting) with vehicle in unloaded position <sup>3)</sup>.*



- Install the front wheel and tighten the screws. Tightening torque, see [page 203](#).

#### Tightening torque

Components	Tightening torque
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Wishbone (transversal) to the auxiliary frame console <sup>3)</sup> ◆ Use new fastening screws	70 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°

3) Tighten the bolts/nuts with vehicle unloaded [page 8](#)



## 4.7 Auxiliary frame console (►04/13) - remove and install

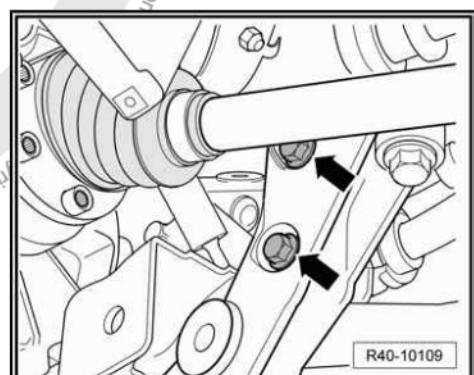
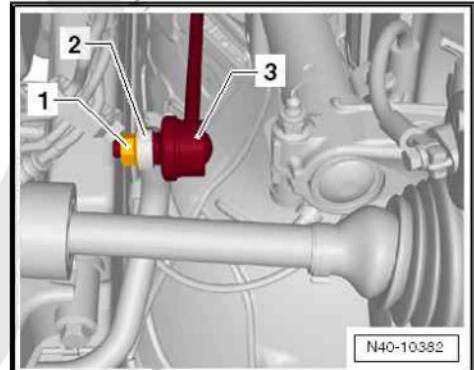
### 4.7.1 Removal



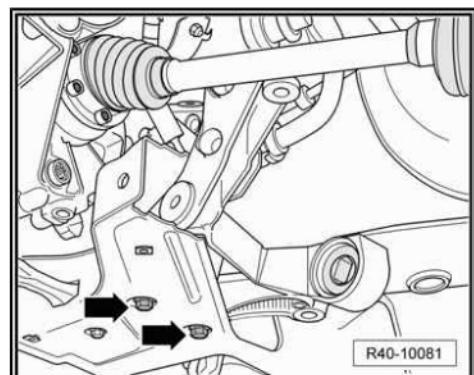
#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

- Remove the wishbone (transversal) ⇒ [page 24](#) .
- Remove the hexagonal nuts -1- from both sides of the coupling rod.
- Remove the coupling rod -3- on the anti-roll bar -2-, on both sides.



- Remove the fastening screws -arrows- for the anti-roll bar.



- Remove the mounting bolts -arrows-.
- Position the auxiliary frame (assembly mounting) ⇒ [page 38](#) .
- Console of the auxiliary frame (sub-frame).



## 4.7.2 Installation



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

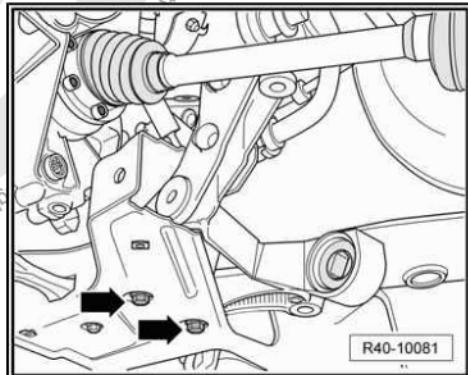
Installation is performed in the reverse sequence to the removal, observing the following:



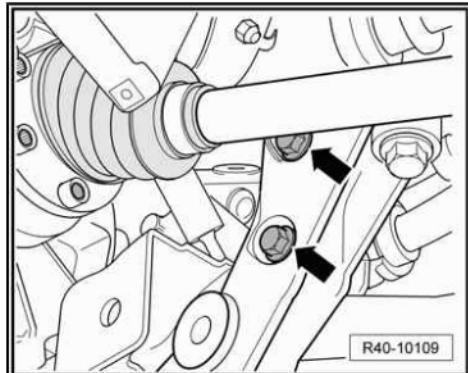
### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

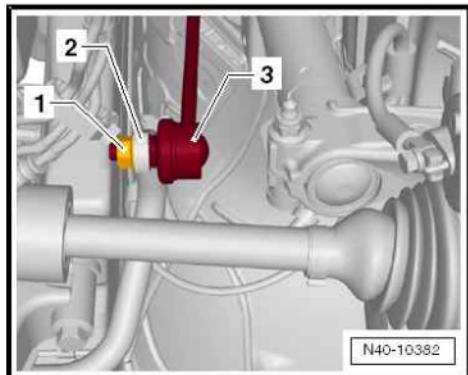
- Install the auxiliary frame console.
- Install the fastening screws -arrows-.
- Position the auxiliary frame (assembly mounting)  
[⇒ page 38](#).



- Install the anti-roll bar onto the console -arrows-. Tightening torque, see [⇒ page 31](#)



- Install the coupling rod -3- on the anti-roll bar -2-, on both sides. Tightening torque, see [⇒ page 31](#)
- Install the wishbone (transversal) [⇒ page 24](#).





### Tightening torque

Components	Tightening torque
Auxiliary frame console ④) ◆ Use new fastening screws	70 Nm + 90°
Body console ◆ Use new fastening screws	70 Nm + 90°
Auxiliary frame console ④) ◆ Use new fastening screws	50 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm
Console wishbone ◆ Use new fastening screws	20 Nm + 90

4) Tighten the bolts/nuts with vehicle unloaded [⇒ page 8](#)

### 4.8 Rubber support bearing for the console (►04/13) - replace

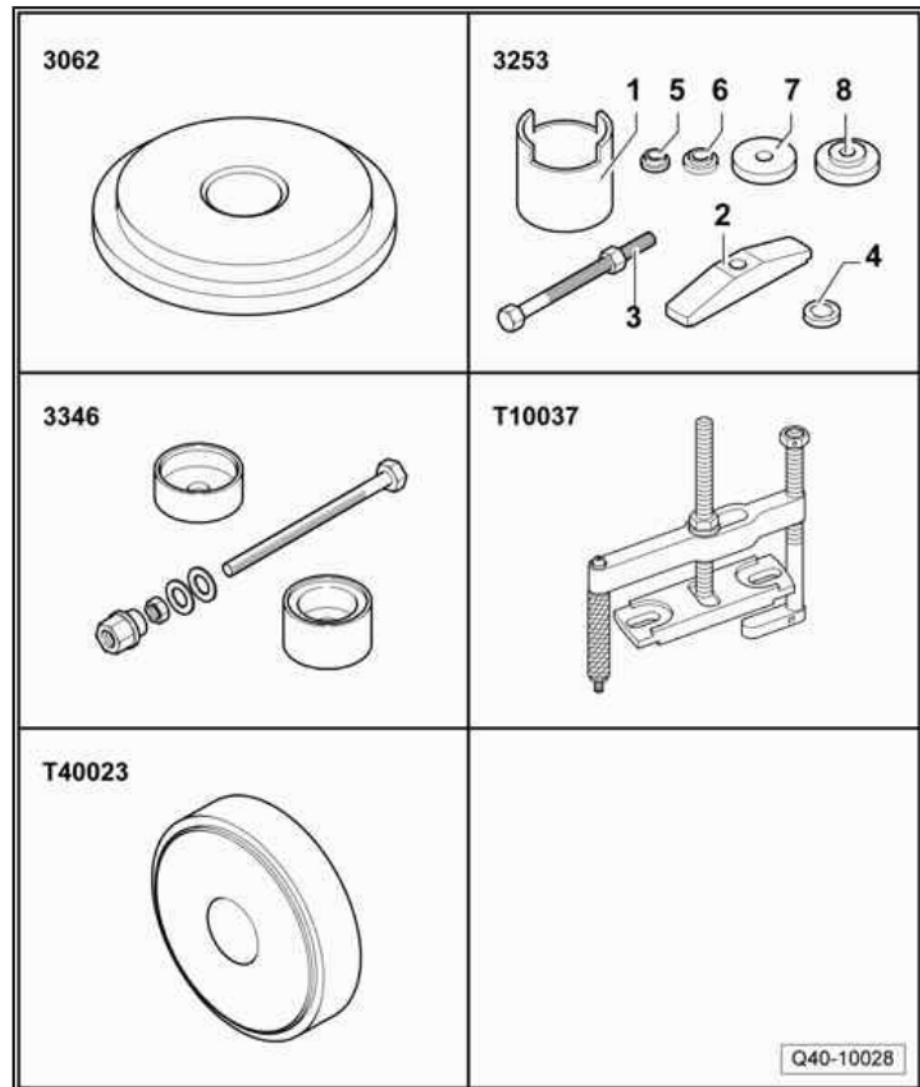


#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*



Special tools and workshop equipment required



- ◆ Press tool - 3062-
- ◆ Assembly tool - 3253-
- ◆ drift sleeve - 3346-
- ◆ Puller - T10037-
- ◆ Puller / Fitter - T 40023-

#### 4.8.1 Remove the rubber support bearing (►04/13) - (versions 1 and 2)



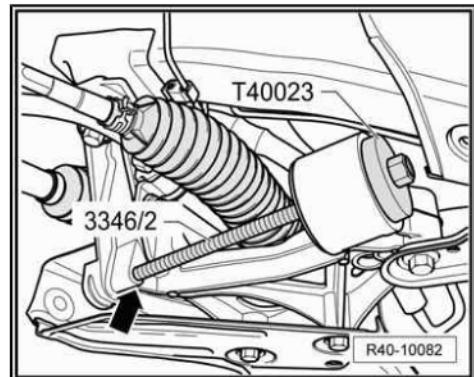
##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [► page 204](#)*

- Remove the wishbone (transversal) [► page 24](#) .
- Partially remove the noise insulation, if any ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .



- Press the noise insulation down and position the Fitter - 3346/2- and Puller / Fitter - T 40023- behind the support.
- Using the Fitter - 3346/2- , screw the thread on the console -arrow- until the tool Puller/Fitter - T 40023- seats on the support.
- Remove the rubber bearing.



#### 4.8.2 Install the rubber support bearing on the console (►04/13) - (version 1)



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*



##### Note

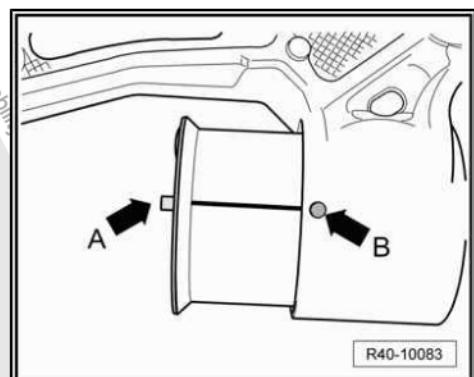
*Installation of the rubber support bearing on the console is made "symmetrically" on both sides, following the procedure below for only one of the sides.*

Installation position for the rubber bearing support on the console:

The pin on the rubber support bearing -arrow A- must be aligned with the console marking -arrow B-.

- Draw a line perpendicular to the pin in the bearing to facilitate the installation, using a ball pen, for example.

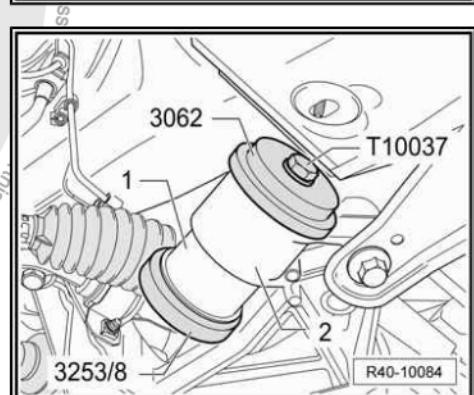
Apply a thin coat of tire assembly paste onto the rubber support bearing.



Install the rubber support bearing -1- on the console -2-.

Install the noise insulation, if any ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .

- Install the wishbone (transversal) ⇒ [page 24](#) .





#### 4.8.3 Install the rubber support bearing on the console (►04/13) - (version 2)



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

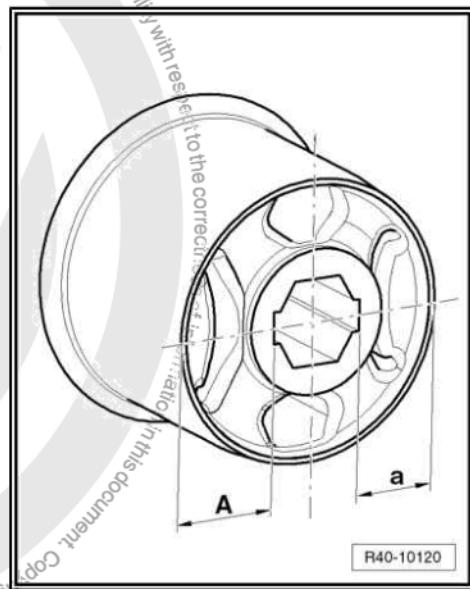


##### Note

*Installation of the rubber support bearing on the console is made "symmetrically" on both sides, following the procedure below for only one of the sides.*

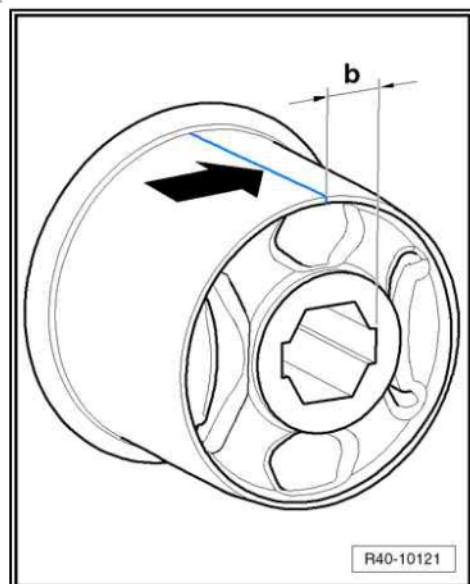
Identify the following measurements on the rubber support bearing:

- ◆ -A- is the larger measurement
- ◆ -a- is the smaller measurement



- Trace a parallel line -arrow- in relation to the face identified as the "smaller measurement". The value of the measurement -b- should be 12 mm.

To facilitate the procedure, use a marker pen, for example.

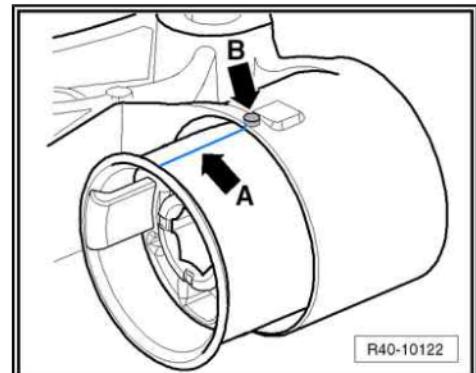




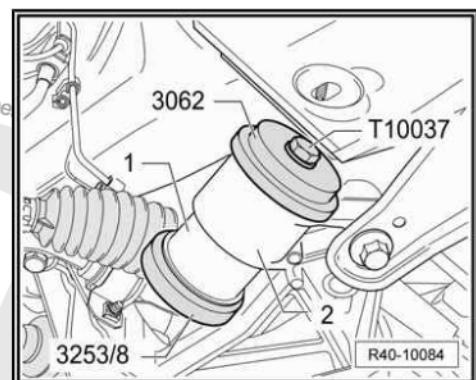
Installation position for the rubber bearing support on the console:

The line traced on the rubber support bearing -arrow A- must be aligned with the console marking -arrow B-.

- Apply a thin coat of tire assembly paste onto the rubber support bearing.



- Install the rubber support bearing -1- on the console -2-.
- Install the noise insulation, if any ➤ Body - external assembly works; Rep. gr. 50 ; Body - front section
- Install the wishbone (transversal) ➤ [page 24](#) .



#### 4.9 Auxiliary frame (assembly mounting) (►04/13) - remove and install

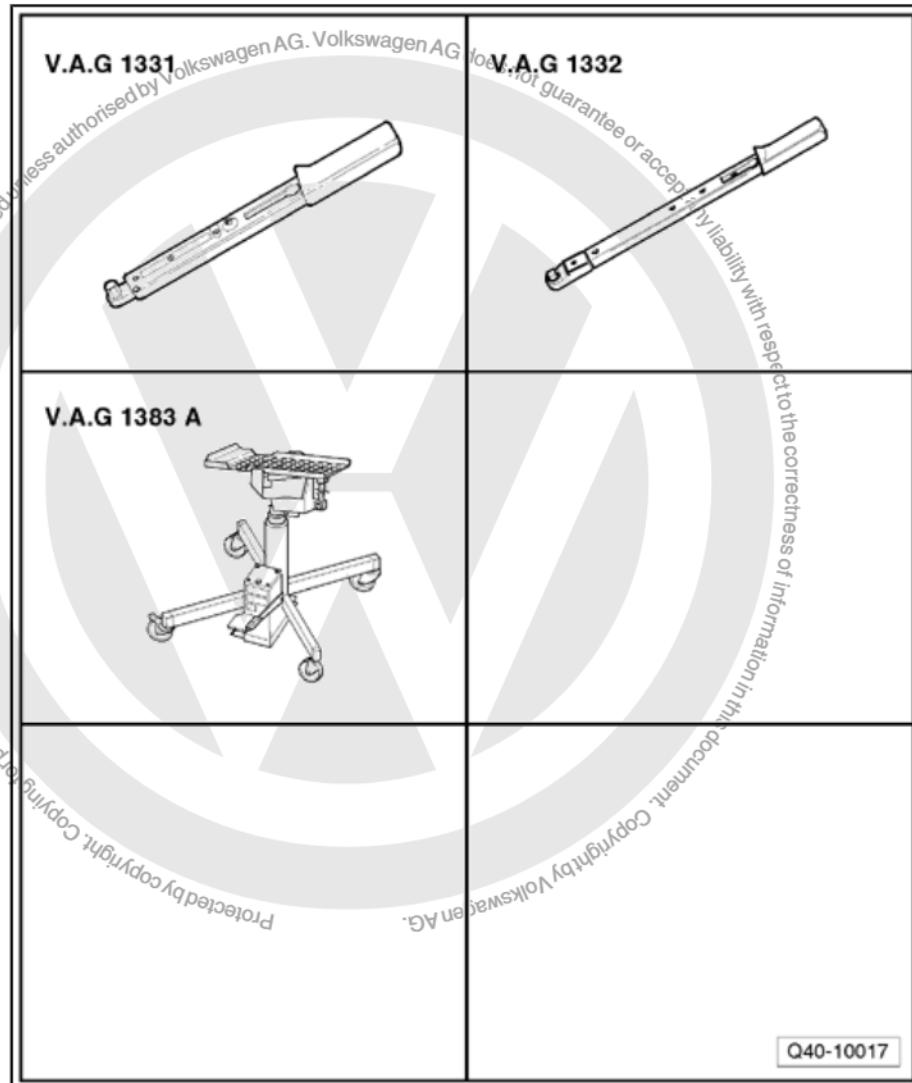


##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ➤ [page 204](#)*



## Special tools and workshop equipment required



- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-

### 4.9.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

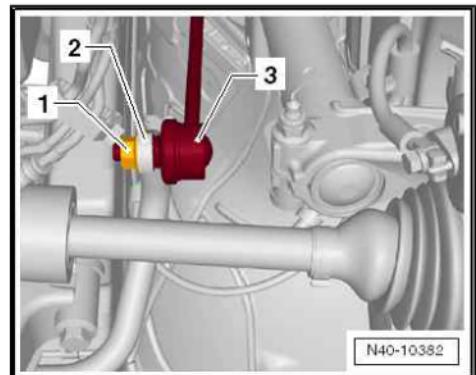
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the front wheels.



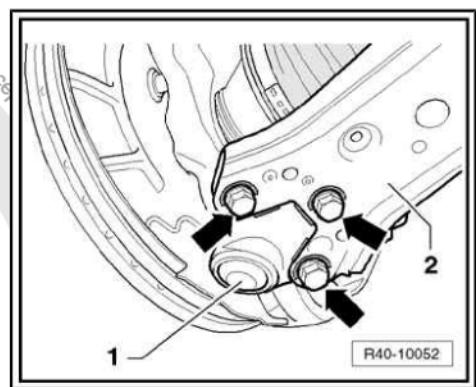
Continuation for vehicles with anti-roll bar:

- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

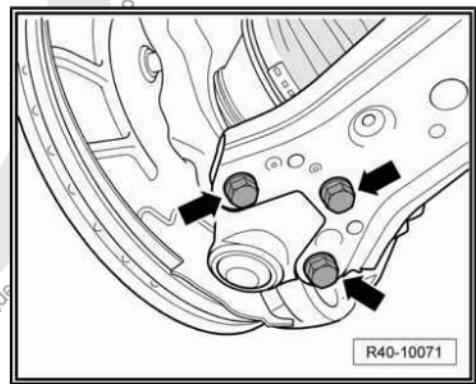
Continuation for all vehicles:



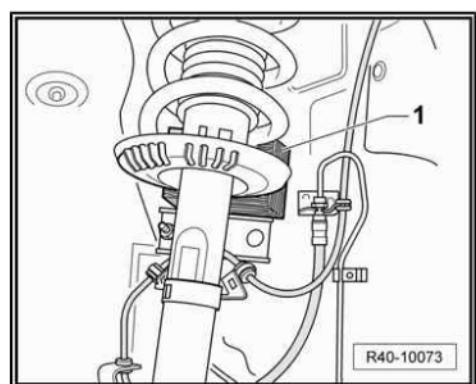
- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

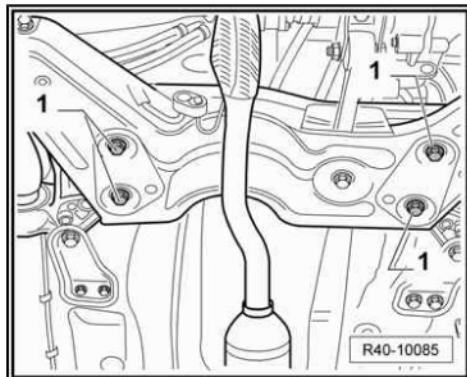


- Pull the suspension strut out and support it using a wood block -1- (for example).





- Loosen the fastening screws -1- for the steering box from the auxiliary frame and fasten it to the body (using wire, for example).
- Position the auxiliary frame (assembly mounting)  
[⇒ page 38](#).
- Lower the auxiliary frame Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- .



#### 4.9.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

*Always replace self-locking nuts and bolts subject to angular torque*

- Position the auxiliary frame (assembly mounting)  
[⇒ page 38](#).
- Fasten the steering box to the auxiliary frame. Tightening torque, see [⇒ page 38](#).
- Check alignment [⇒ page 204](#).

##### Tightening torque

Components	Tightening torque
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Steering box to auxiliary frame ◆ Use new fastening screws	50 Nm + 90°

#### 4.10 Auxiliary frame (assembly mounting) - position



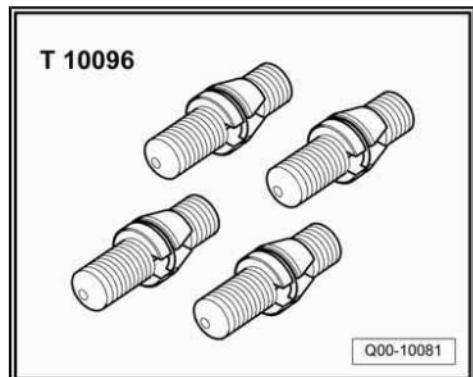
##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

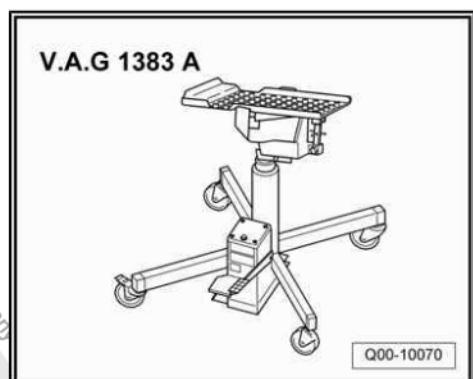
Special tools and workshop equipment required



- ◆ Location pins - T10096-



- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-



#### 4.10.1 Removal



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

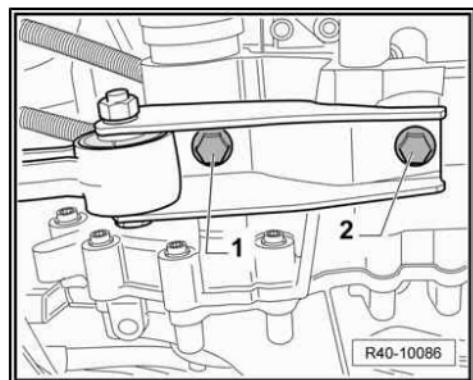


##### Note

*This procedure is only valid for the "Fox". For the "Crossfox", it is necessary to check and align the vehicle ⇒ [page 204](#).*

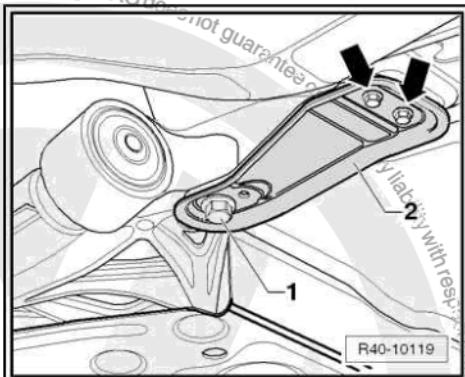
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove pendulum support bolts -1- and -2- from the gearbox.
- Remove the front tube (exhaust) ⇒ Engine; Rep. gr. 26 ; Exhaust system .
- Place the Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- and Tray for EQ 7081 hydraulic jack - VAG 1359/2- under the auxiliary frame (sub-frame).

The sequence of the following work stages must be obligatorily observed:





- Remove the fastening screw -1- from the rear support -2- and the auxiliary frame (sub-frame).
- Remove fastening nuts -arrows- and remove the rear support -2-.



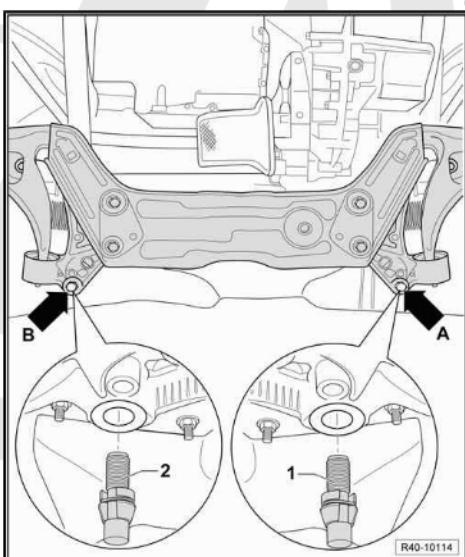
- Remove securing bolt -arrow A- from the auxiliary frame and install the Location pins - T10096- -1- using a torque of 20 Nm.
- Remove fastening screw -arrow B- from the auxiliary frame and install the Location pins - T10096- -2- using a torque of 20 Nm.



#### Note

*The Location pins - T10096- must only be tightened to a maximum of 20 Nm. Otherwise, the device thread will be damaged.*

- Remove the next screw and install the Location pins - T10096- again to 20 Nm.
- The auxiliary frame (sub-frame) positioning will be concluded when all 4 bolts have been replaced by the Location pins - T10096-.
- Carefully lower the auxiliary frame (sub-frame) approximately 5 cm, or only the distance necessary.



#### 4.10.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



##### WARNING

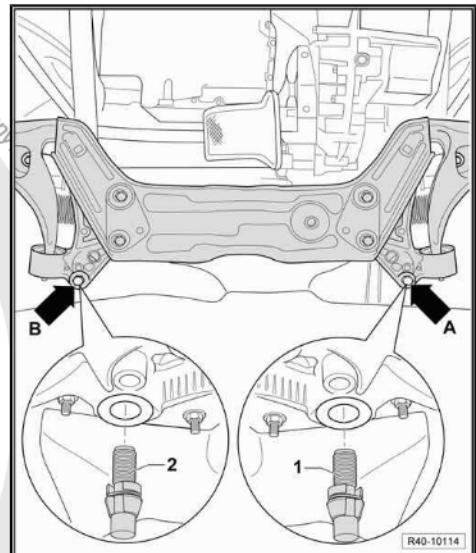
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

*Replace self-locking nuts and bolts subject to angular torque.*

- Carefully position the auxiliary frame (assembly mounting).



- Always remove only one Location pin - T10096- at a time and replace it with a new screw -arrow-.
- Tighten the fastening bolts to the auxiliary frame (assembly mounting). Tightening torque, see [page 41](#).
- Check alignment [page 204](#).



#### Tightening torque

Components	Tightening torque
Body console ◆ Use new fastening screws	70 Nm + 90°
Rear body support ◆ Use new fastening screws	20 Nm + 90°
Pendulum support to gearbox ◆ Use new fastening screws	30 Nm + 90°

#### 4.11 Anti-roll bar (►04/13) - remove and install

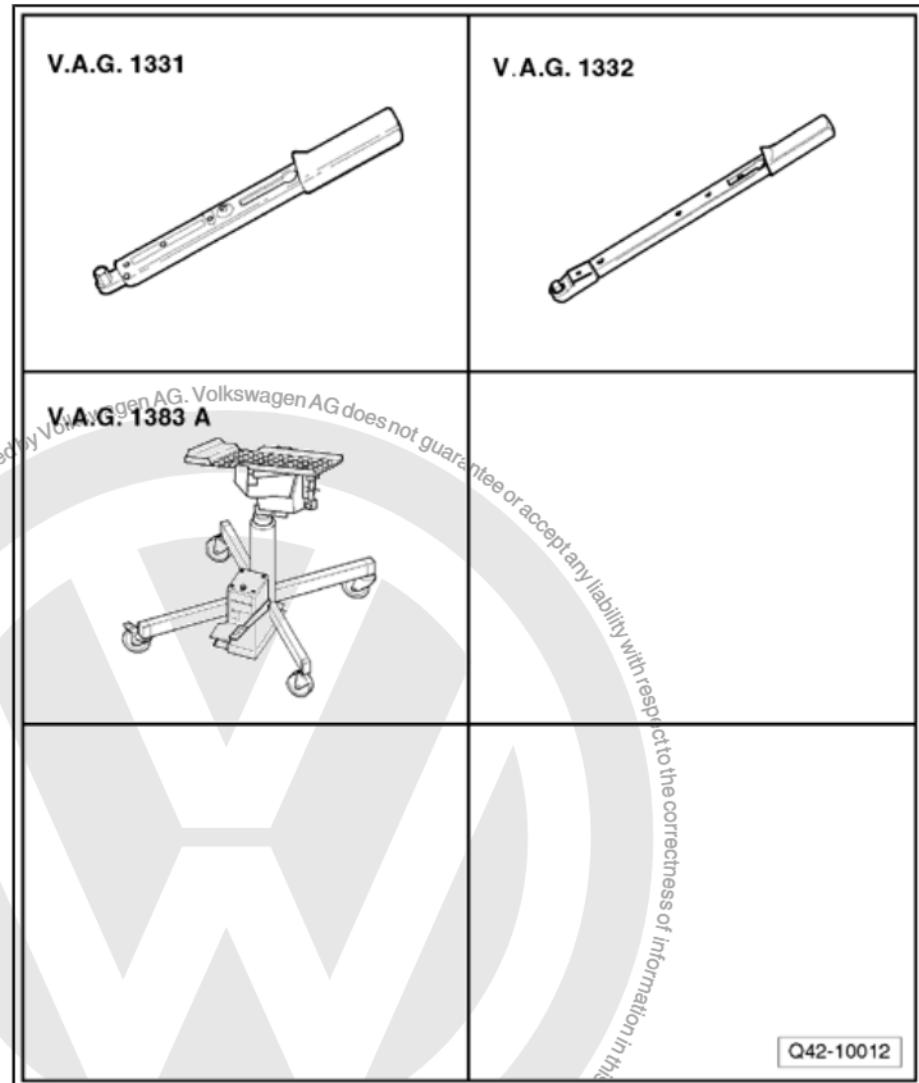


##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [page 204](#)*



Special tools and workshop equipment required



- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-

#### 4.11.1 Removal



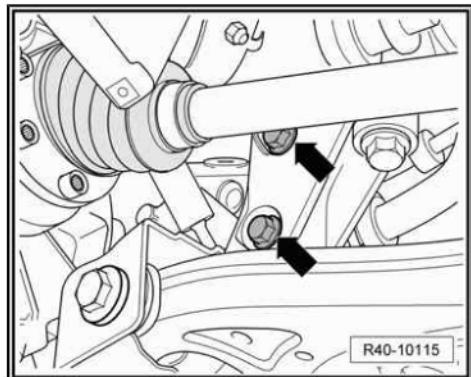
##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

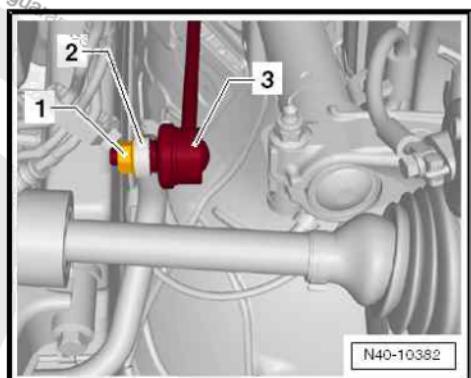
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the front wheels.
- Remove the noise insulation, if any ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .



- Remove the securing bolts -arrows- (both sides).



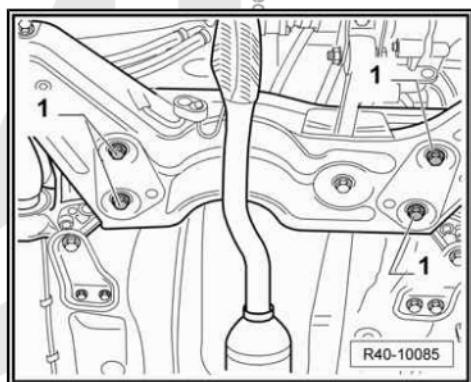
- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.



- Loosen the fastening bolts -1- for the steering box to auxiliary frame and fasten it to the body (using wire, for example).
- Position the auxiliary frame (assembly mounting) [⇒ page 38](#).

Continuation:

- Remove the anti-roll bar by its side.



#### 4.11.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

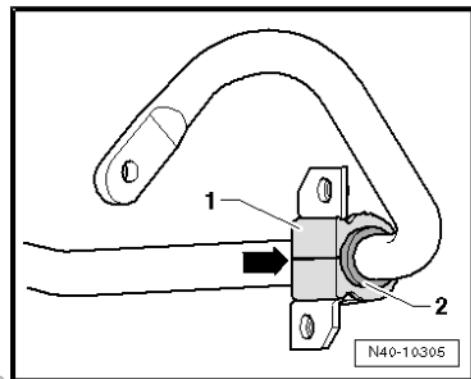
*Replace self-locking nuts and bolts subject to angular torque.*



- Install a new rubber bearing -1- on the anti-roll bar through the opening -arrow-.

**Note**

- ◆ Make sure that the rubber bearing exterior edge -1- touches the stop -2-.
- ◆ Depending on the version, the stop -2- may be located at right or left of the rubber bearing.



- Install the anti-roll bar and secure it to the console with clamps. Tightening torque, see [⇒ page 44](#)
- Place the auxiliary frame [⇒ page 38](#).
- Fasten the steering box to the auxiliary frame (assembly mounting). Tightening torque, see [⇒ page 44](#).
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#).
- Check alignment [⇒ page 204](#).

**Tightening torques**

Components	Tightening torques
Console wishbone ◆ Use new fastening screws	20 Nm + 90°
Steering box to the auxiliary frame (sub-frame) ◆ Use new fastening screws	50 Nm + 90°



5 I - Auxiliary frame (assembly mounting) , anti-roll bar, wishbones (04/13►) - repair

5.1 Auxiliary frame (assembly mounting), anti-roll bar, wishbones (04/13►) - assembly overview



**WARNING**

- ◆ *Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.*  
[⇒ page 204](#)
- ◆ *Always replace self-locking nuts and bolts subject to angular torque*
- ◆ *Soldering and straightening operations are not permitted on the suspension supporting components or on those components in which the wheels are mounted*
- ◆ *Always replace corroded bolts/nuts*



**Note**

*When replacing components with metal and rubber supports, or when screws/nuts have been removed from such components, you must lift the unloaded axle before tightening* [⇒ page 8](#)



1 - Auxiliary frame (assembly mounting)

- different versions
- See: [⇒ Electronic parts catalogue "ETKA"](#)
- Remove and install  
[⇒ page 61](#)

2 - Hexagonal nut

- Self-locking
- 40 Nm
- Replace once removed

3 - Anti-roll bar

The auxiliary frame (assembly mounting) must be lowered to remove/install the anti-roll bar

- Remove and install  
[⇒ page 68](#)

4 - Rubber support (bearing)

- Always replace both sides
- See: [⇒ Electronic parts catalogue "ETKA"](#)
- To remove, loosen the fastening bolts (Position 21)

5 - Clamp

6 - Hexagonal nut

- Self-locking
- 40 Nm
- Replace once removed

7 - Coupling rod

- Tighten the locknut upon aligning the vehicle
- Only for vehicles with anti-roll bar
- Between anti-roll bar and suspension strut

8 - Hexagonal nut

- Self-locking
- Replace once removed

9 - Support

10 - Hexagon socket head bolt

- 20 Nm + 90°
- Replace once removed

Repair the thread in the longitudinal member [⇒ page 47](#)

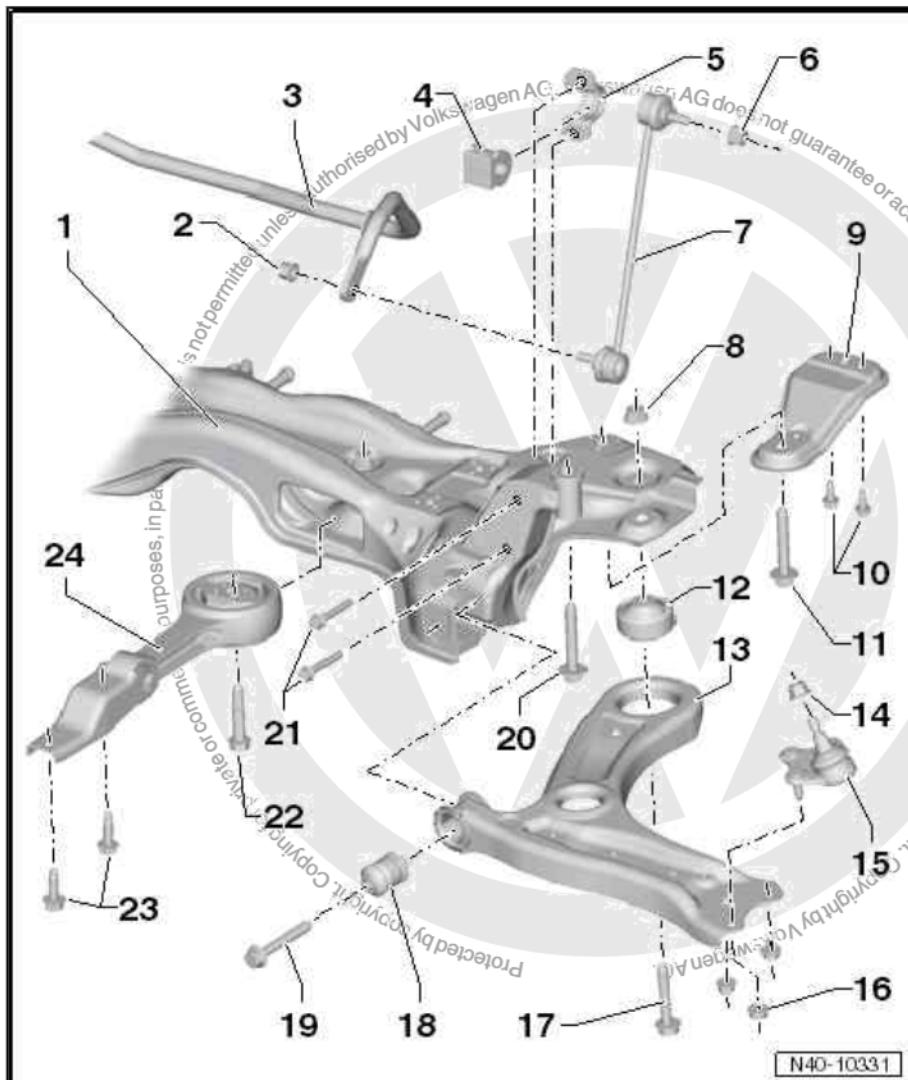
11 - Hexagonal bolt

- 70 Nm + 180°
- Replace once removed

Repair the thread in the longitudinal member [⇒ page 47](#)

12 - Metal/rubber bearings (rear) of the wishbone

- Renew [⇒ page 58](#)





13 - Wishbone (transversal)

- Remove and install ⇒ [page 53](#)

14 - Hexagonal nut

- Self-locking
- 20 Nm + 90°
- Replace once removed

15 - Swivel guide

- Check ⇒ [page 47](#)
- Remove and install ⇒ [page 48](#)
- Installation position ⇒ [page 53](#)

16 - Hexagonal nuts

- Self-locking
- 40 Nm + 45°
- Replace once removed

17 - Hexagonal bolt

- 70 ± 7 Nm + 90° ± 10°
- Replace once removed

18 - Metal/rubber bearings (front) of the wishbone

- Renew ⇒ [page 56](#)

19 - Hexagonal bolt

- 70 ± 7 Nm + 90° ± 10°
- Replace once removed

20 - Hexagonal bolt

- 70 Nm + 180°
- Replace once removed

Repair the thread in the longitudinal member ⇒ [page 47](#)

21 - Hexagon socket head bolt

- 20 Nm + 90°
- Replace once removed

22 - Hexagonal bolt

- 40 Nm + 90°
- Replace once removed

23 - Hexagon socket head bolt

- 30 Nm + 90°
- Replace once removed

24 - Pendulum support

- See: ⇒ Electronic parts catalogue "ETKA"

## 5.2 Thread in longitudinal member - repair

Repairing the thread of nuts welded onto the car body is possible under certain circumstances, refer to ⇒ Body Repairs; Rep. gr. 50 .

## 5.3 Swivel joint - check for clearance

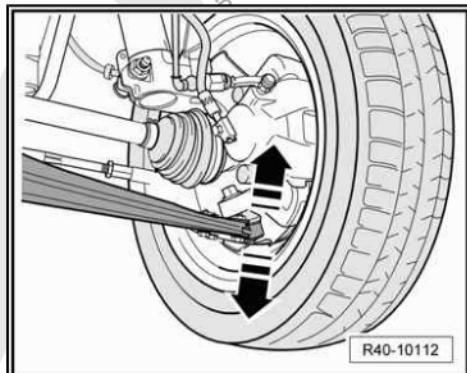
Check axial clearance:

- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.



- Forcibly pull down the wishbone -direction of the arrow- and press it up again.

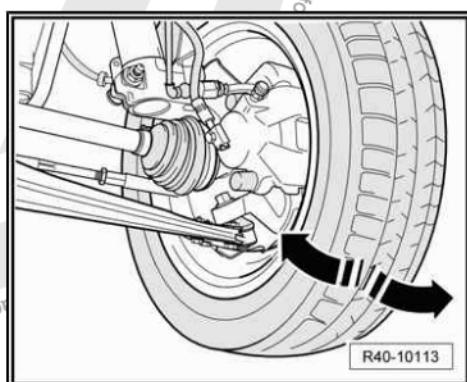
Check radial clearance



- Straighten the wheels/steering wheel.
- Press the lower section of the wheel forcefully outwards and inwards -direction of the arrow-.
- Turn the wheels/steering wheel to the left and repeat verification.
- Turn the wheels/steering wheel to the right and repeat verification.

 Note

- ◆ There should be no perceptible or visible "gap" during either check.
- ◆ Observe the swivel joint during the check
- ◆ Consider an eventual "clearance" in the wheel roller bearing or in the upper support of the suspension strut
- ◆ Check the rubber boot for damages, replace the swivel joint, if necessary



## 5.4 Swivel guide (04/13►) - remove and install

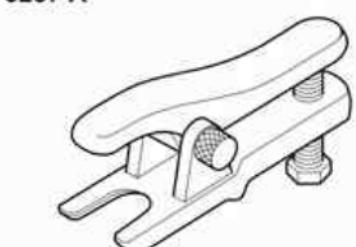
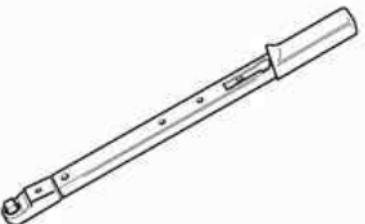
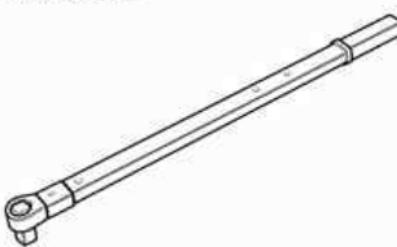
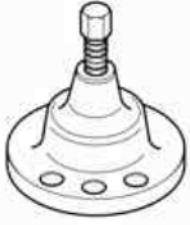


### WARNING

Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [≥ page 204](#)



Special tools and workshop equipment required

 <p>3287 A</p>	 <p>V.A.G 1332</p>
 <p>V.A.G 1383 A</p>	 <p>V.A.G 1576</p>
 <p>3283</p>	

Q40-10048

- ◆ Puller - 3287A-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ "Torque wrench - 75 to 400 Nm (fit. 3/4" drive) - VAG 1576-
- ◆ Puller - 3283-

#### 5.4.1 Removal



##### WARNING

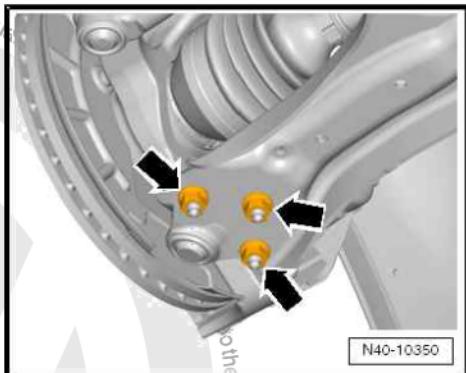
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Loosen the fastening nut (dodecahedron) from the drive shaft  
[⇒ page 145](#)
- Remove the respective wheel.



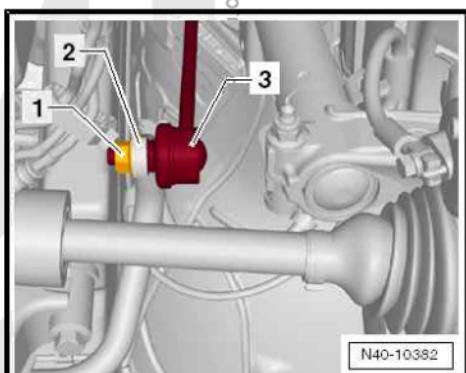
- Remove the mounting nuts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:

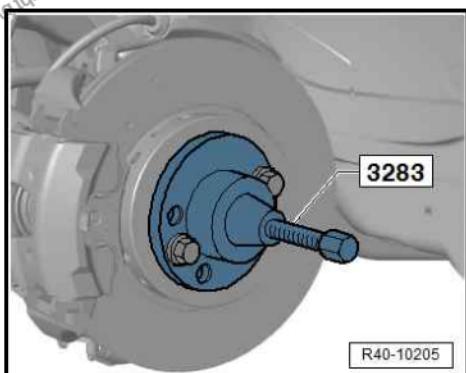


- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



Note

*While the drive shaft is being pressed outwards, observe if there is enough free space.*

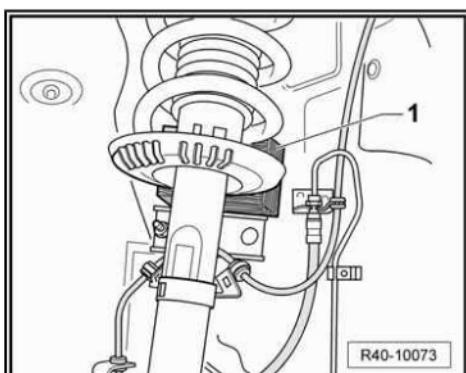


- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



Note

*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*



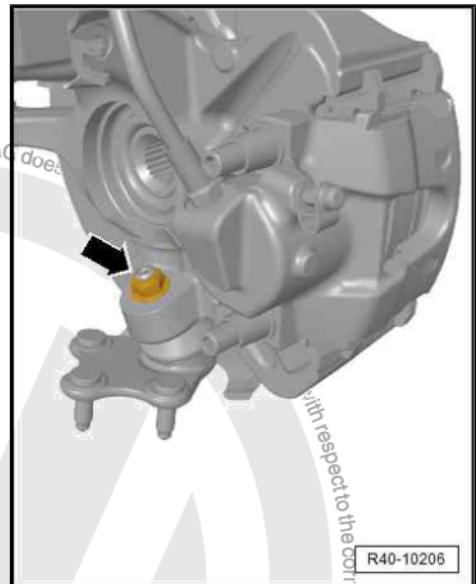


- Loosen the hexagonal union nut -arrow- on the swivel guide.



**WARNING**

*To protect the thread, leave the nut screwed a few turns at the swivel joint.*



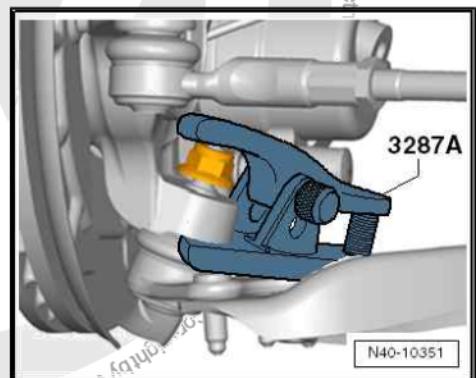
- Position the Puller -3287A- as shown in illustration and press the swivel joint out.



**Note**

*Position the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-, or something similar (danger of accidents due to parts that may fall when the axle joint is removed).*

- Remove swivel guide.



## 5.4.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



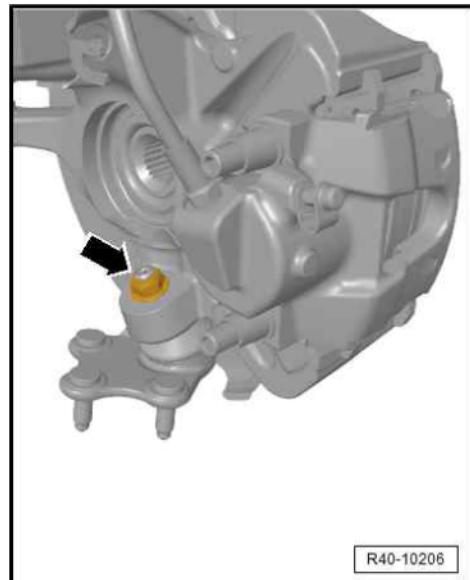
**WARNING**

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

*Replace self-locking nuts and bolts subject to angular torque.*

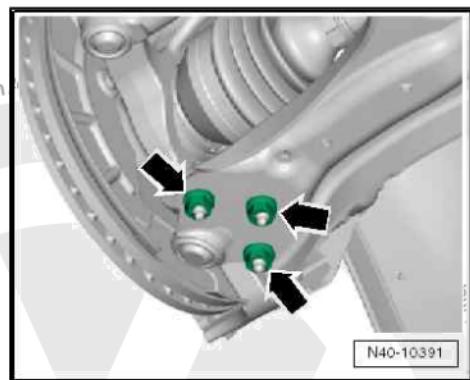


- Install the swivel joint on the wheel roller bearing case.
- Tighten the self-locking nuts -arrow-, holding the bolt with the Torx T40 wrench. Tightening torque, see [page 52](#).
- Install the drive shaft in the wheel roller bearing [page 148](#)
- Insert the swivel joint in the wishbone.



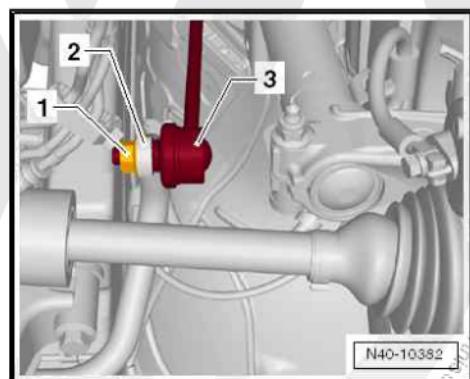
R40-10206

- Tighten union nuts -arrows- to the swivel joint on the wishbone. Tightening torque, see [page 52](#).



N40-10391

- Install the coupling rod -3- on the anti-roll bar -2-, on both sides. Tightening torque, see [page 52](#)
- Install the front wheel and tighten the screws. Tightening torque, see [page 203](#)
- Install and tighten the union nut (dodecahedron). Tightening torque, see [page 146](#)



N40-10382

#### Tightening torques

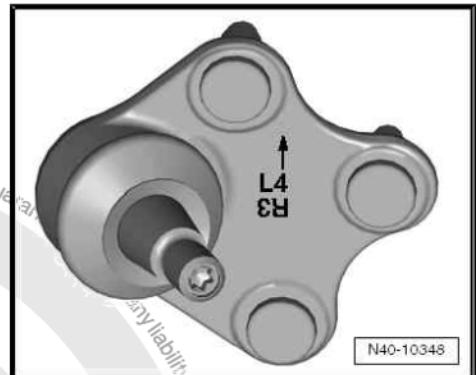
Components	Tightening torque
Swivel joint to wishbone ◆ Use new fastening nuts	40 Nm + 45°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm
Swivel joint to wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°



## 5.5 Swivel guide (04/13►) - installation position

### Left swivel joint

The arrow marked "L4" points in the vehicle travelling direction for the 14" wheel running gear (FS III brake calipers).



N40-10348

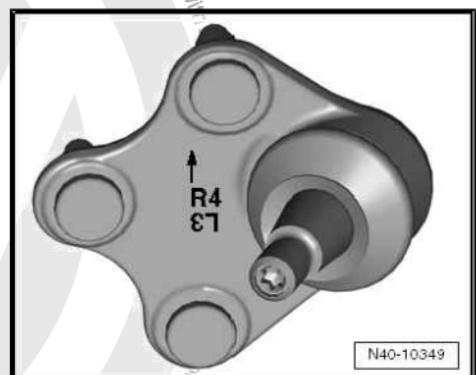
### Right swivel joint

The arrow marked "R3" points in the vehicle travelling direction for the 13" wheel running gear (FS II brake calipers).



#### Note

*Carefully check the position for installing the swivel guides, as the caster will be wrong if the inclination position is incorrect.*



N40-10349

## 5.6 Wishbone (transversal) (04/13►) - remove and install

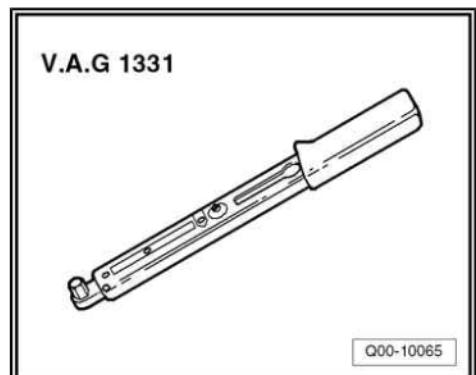


#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

### Special tools and workshop equipment required

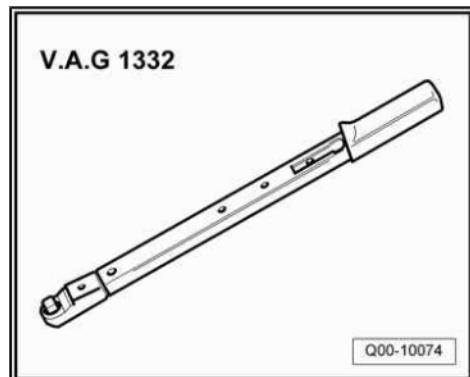
- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-



Q00-10065



- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-



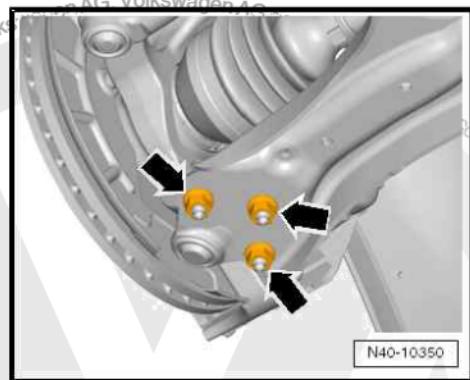
### 5.6.1 Removal



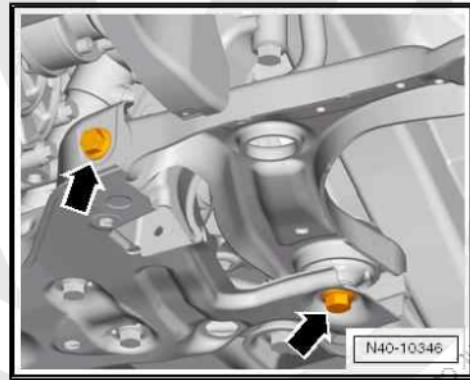
#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the respective front wheel.
- Remove the mounting nuts -arrows-.



- Remove the mounting bolts -arrows-.
- Remove the wishbone from its housing.



### 5.6.2 Installation

Installation is performed in reverse to removal sequence, considering the following:

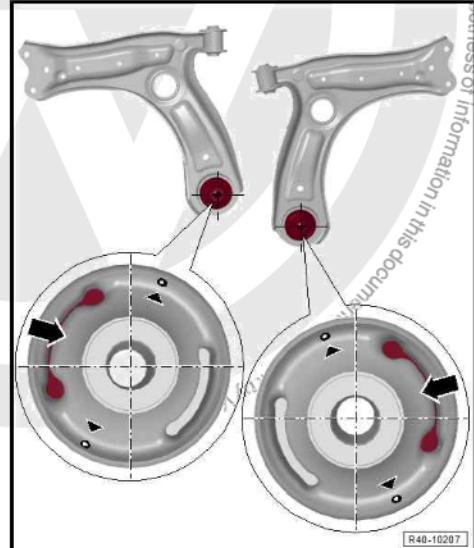


### WARNING

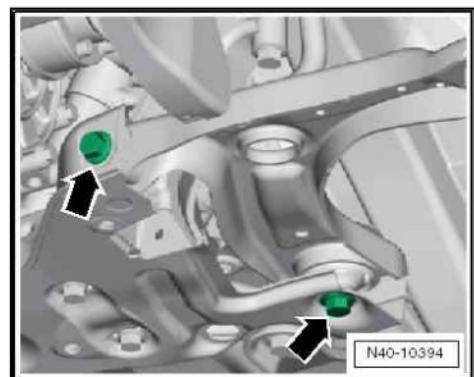
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

*Replace self-locking nuts and bolts subject to angular torque.*

- Apply from 0.01...0.05 grams (thin layer) of Silicone-based grease - G 000 405 A2- to the larger eccentrics -arrows- of the metal-rubber bearings. Refer to the ⇒ Chemicals Manual .
- ◆ Wishbone - (left side) -A-
- ◆ Wishbone - (right side) -B-
- ◆ Larger eccentrics -arrows- and application locations of the Silicone-based grease - G 000 405 A2- (upper and lower sides)
- Position the wishbone in its housing.
- Install the wishbone to its housing with the help of a rubber hammer if necessary.
- Install the fastening bolts -arrows- and only pre-tighten them.



- Place and firmly tighten the bolts -arrows- .
- Insert the swivel joint in the wishbone.



- Tighten union nuts -arrows-to the swivel joint on the wishbone. Tightening torque, see ⇒ [page 56](#) .

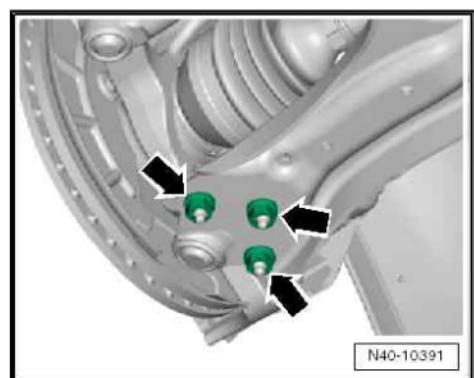
The remainder of the installation is performed in reverse sequence to the removal, considering the following:



### WARNING

*Tighten the fastening bolts and nuts of the wishbone with the auxiliary frame (assembly mounting) with vehicle in unloaded position <sup>5)</sup> .*

- Install the front wheel and tighten the screws. Tightening torque, see ⇒ [page 203](#)





#### Tightening torques

Components	Tightening torque
Swivel joint to wishbone ◆ Use new fastening nuts	40 Nm + 45°
Wishbone (transversal) to auxiliary frame 5) ◆ Use new fastening bolts/nuts	70 ± 7 Nm + 90°±10°

5) Tighten the bolts/nuts with vehicle unloaded [⇒ page 13](#)

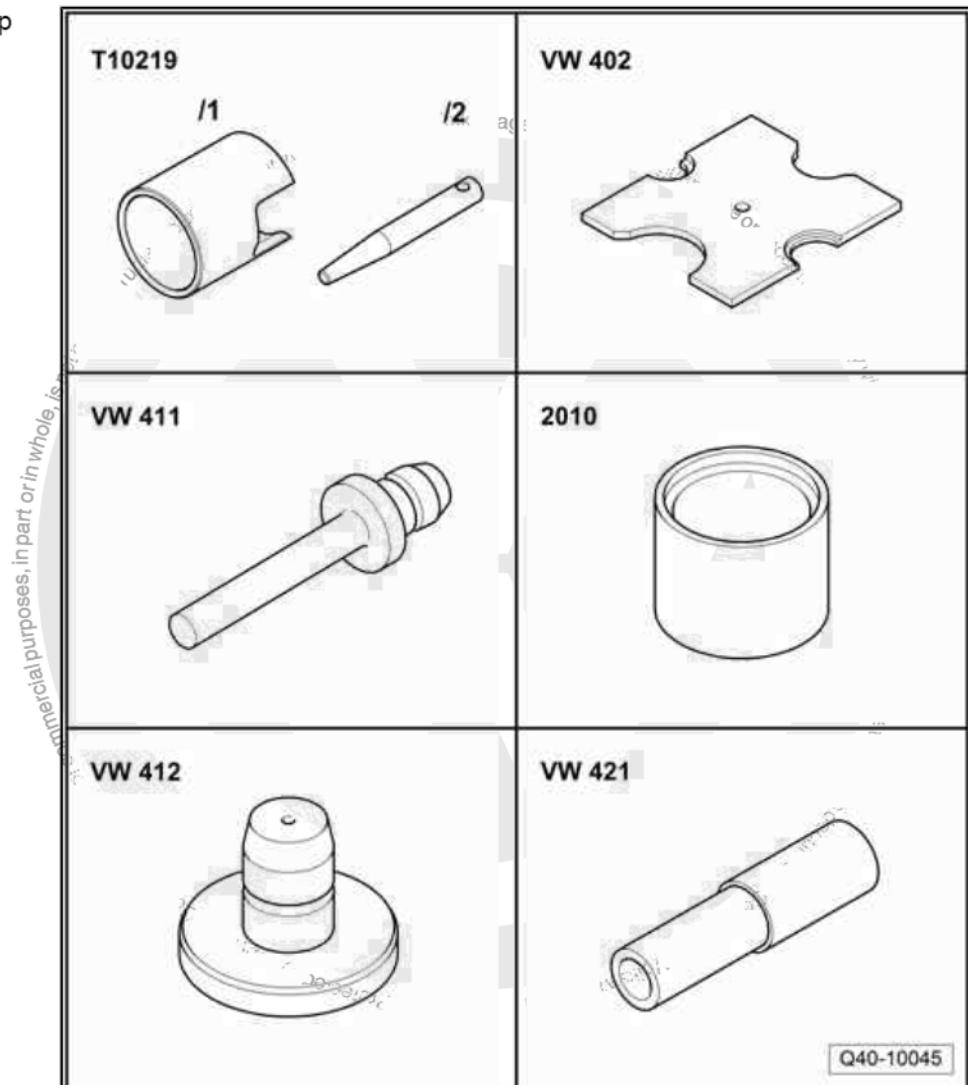
#### 5.7 Wishbone (04/13►) - replace front metal-rubber bearing



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

Special tools and workshop equipment required



Q40-10045



◆ Assembly punch - T10219/2-

◆ Plate - VW 402-

◆ Press tool - VW 411-

◆ Tube - 2010-

◆ Press tool - VW 412-

◆ Press tube - VW 421-

– Remove the wishbone [➡ page 24](#) .

Remove the metal-rubber bearing (front)

– Extract the metal-rubber bearing by pressure, as indicated:

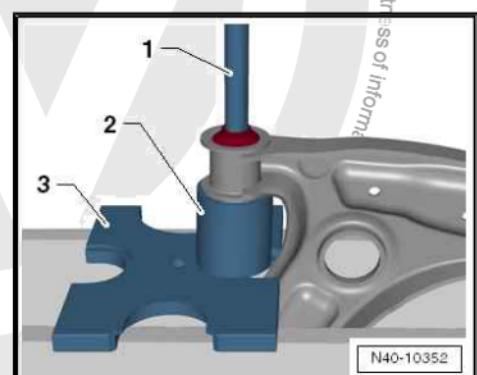
1 - Pressure pin - VW 411-

2 - Tube - 2010- (larger lower diameter in the direction of the wishbone)

3 - Plate - VW 402-

Install the metal-rubber bearing (front)

– Apply a thin coat of tyre assembly paste onto the outside of the metal-rubber bearing.



N40-10352

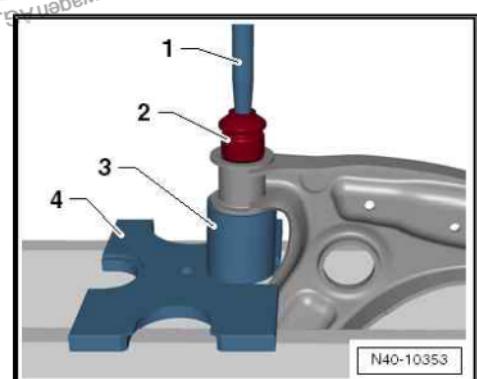
– Extract the metal-rubber bearing by pressure, as indicated:

1 - Pressure tube - VW 421- and Assembly perforation - T10219/2-

2 - Bonded rubber bush

3 - Tube - 2010- (larger internal diameter in the direction of the wishbone)

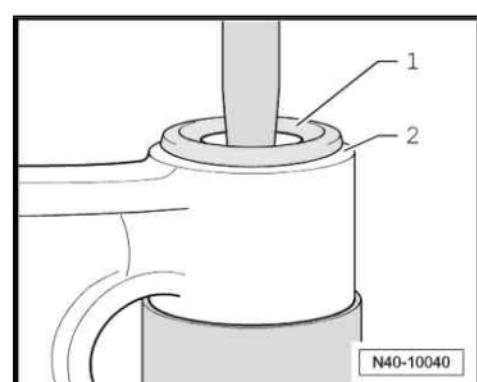
4 - Plate - VW 402-



N40-10353

**Note**  
*When installing the metal-rubber bearing, it could be a little misaligned. This is normal, and upon continuing the installation, it will return to its correct position.*

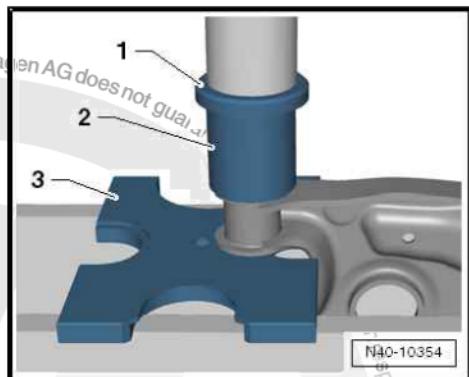
– Install the metal-rubber bearing, until the core -1- and the orifice of the wishbone -2- meet at the same height.



N40-10040

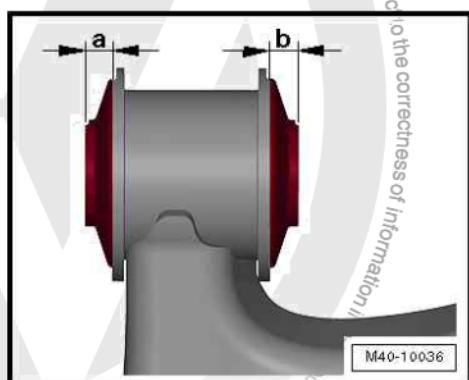


- If necessary, press the set until the metal-rubber bearing is positioned in alignment with the measurement indicated.
- 1 - Pressure disc - VW 412-
- 2 - Tube - 2010- (larger internal diameter in the direction of the wishbone)
- 3 - Plate - VW 402-



The quotas -a- and -b- must be identical.

- Install the wishbone [⇒ page 24](#).



## 5.8 Wishbone (04/13►) - replace front metal-rubber bearing

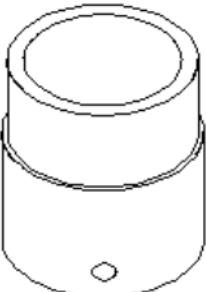
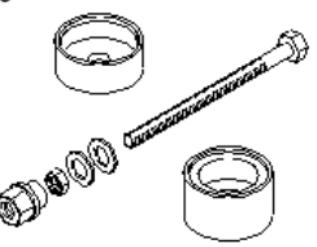
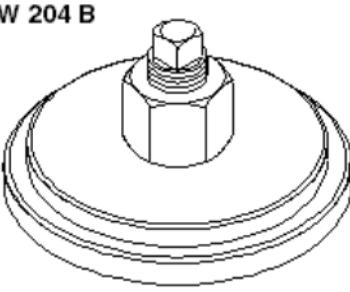
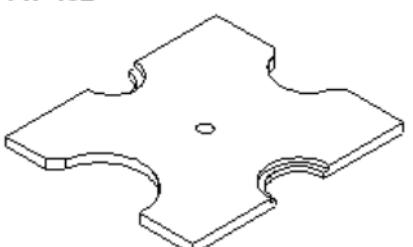
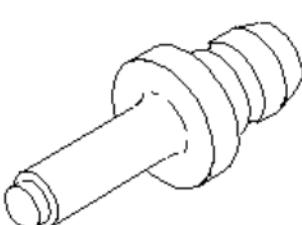
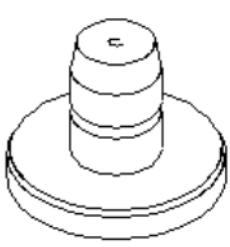


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

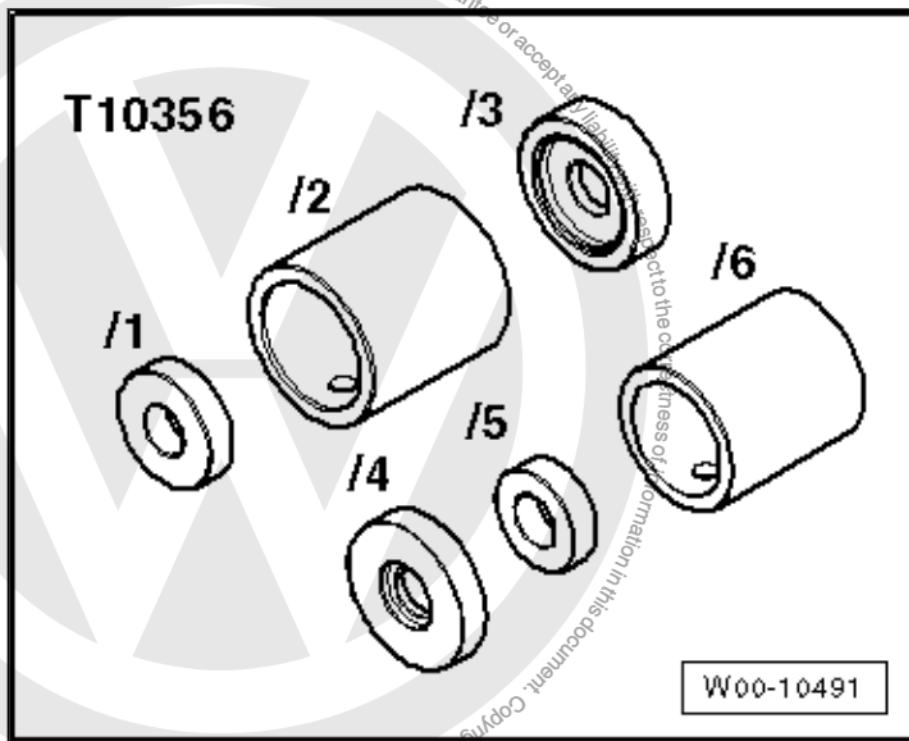


Special tools and workshop equipment required

 <p>3345</p>	 <p>3346</p>
 <p>VW 204 B</p>	 <p>VW 402</p>
 <p>VW 409</p>	 <p>VW 412</p>

W40-10037

- ◆ drift sleeve - 3345-
- ◆ drift sleeve - 3346-
- ◆ drift sleeve - VW 204B-
- ◆ Plate - VW 402-
- ◆ Press tool - VW 409-
- ◆ Press tool - VW 412-



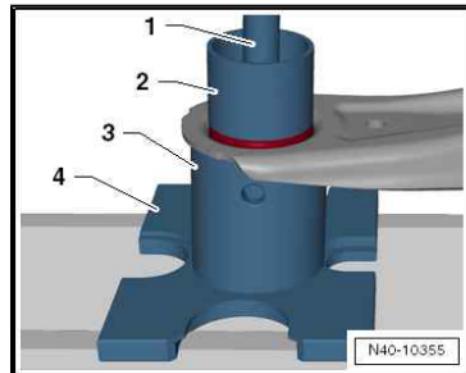
♦ Press tube - T10356/2-

- Remove the wishbone [⇒ page 24](#).

Remove the metal-rubber bearing (rear)

- Extract the metal-rubber bearing by pressure, as indicated:

- 1 - Pressure pin - VW 409-
- 2 - Drift sleeve - 3346/1-
- 3 - Pressure tube - T10356/2-
- 4 - Plate - VW 402-





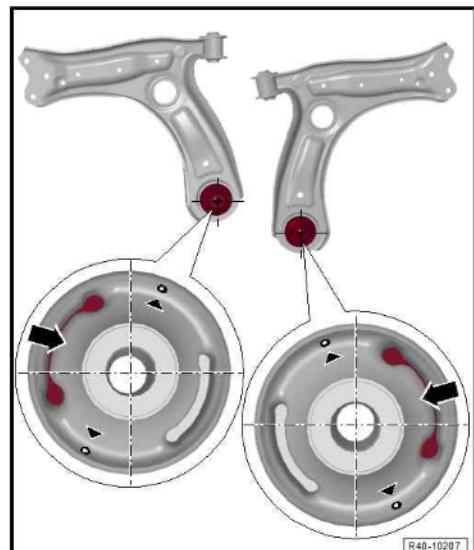
#### Assembly position of the metal-rubber bearing (rear)

- ◆ Wishbone - (left side) -A-
- ◆ Wishbone - (right side) -B-
- ◆ Larger eccentrics -arrows- of the metal-rubber bearing and the location of application of the Silicone-based grease - G 000 405 A2- .



*One of the arrows set into the metal-rubber bearing must be aligned with the mark on the wishbone, and the larger eccentrics -arrows- must be positioned to the sides of the vehicle (outside).*

#### Install the metal-rubber bearing (rear)



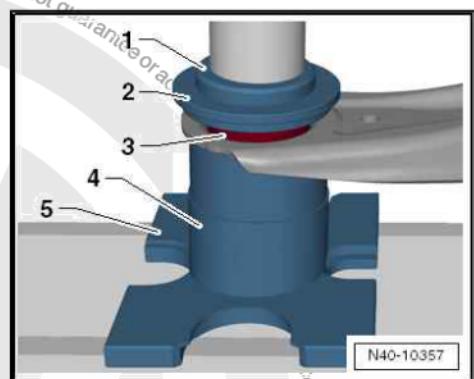
- Extract the metal-rubber bearing by pressure, as indicated:

- 1 - Pressure disc - VW 412-
- 2 - Drift sleeve - VW 204B-
- 3 - Bonded rubber bush
- 4 - Fitter - 3345- (small external diameter in the direction of the suspension arm)
- 5 - Plate - VW 402-



*Install the metal-rubber bearing, until the support of the Fitter - VW 204B- settles onto the wishbone.*

- Install the wishbone [⇒ page 24](#) .



#### 5.9 Auxiliary frame (assembly mounting) (04/13 ➤) - remove and install

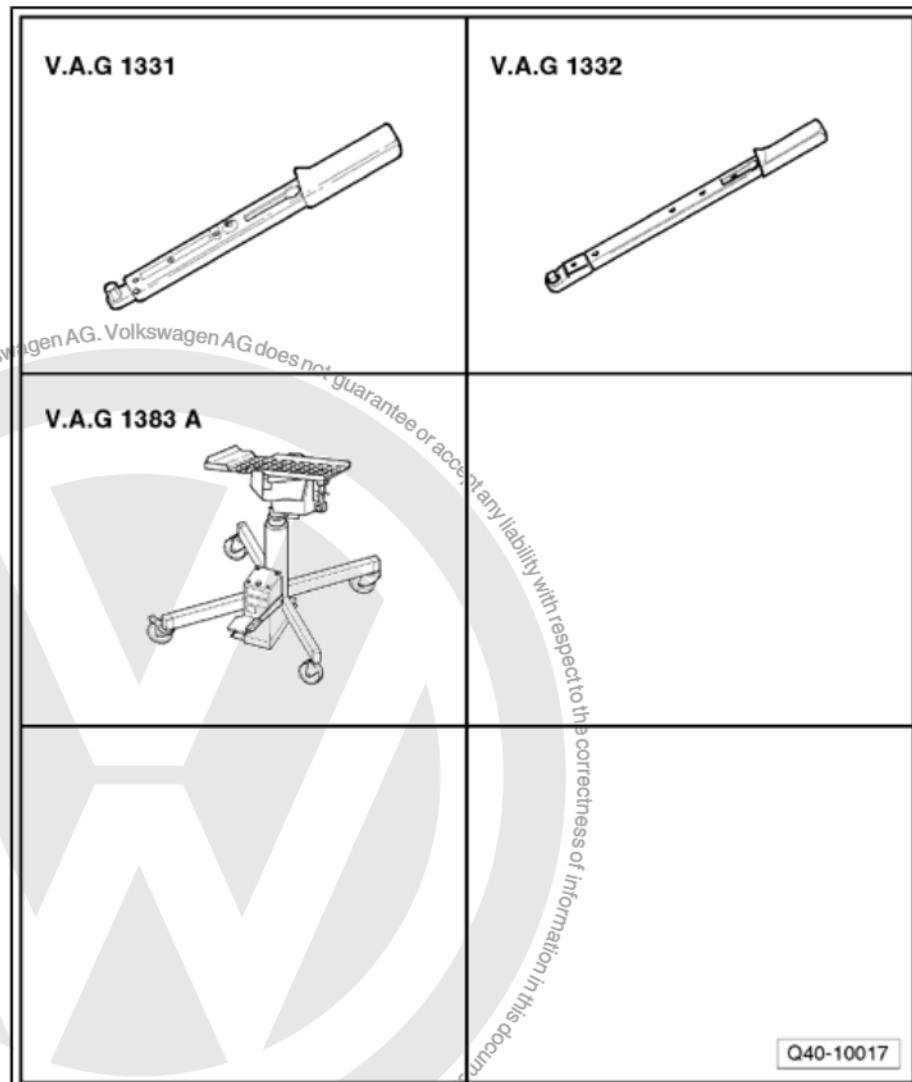


##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*



Special tools and workshop equipment required



- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm (1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-

## 5.9.1 Removal



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

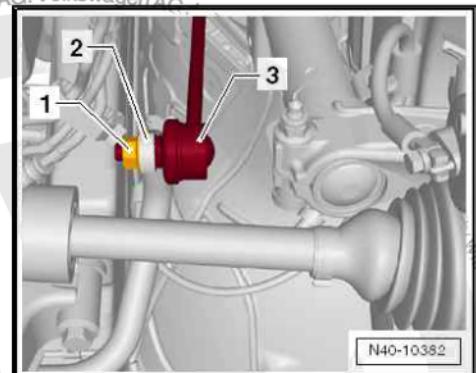
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the front wheels.



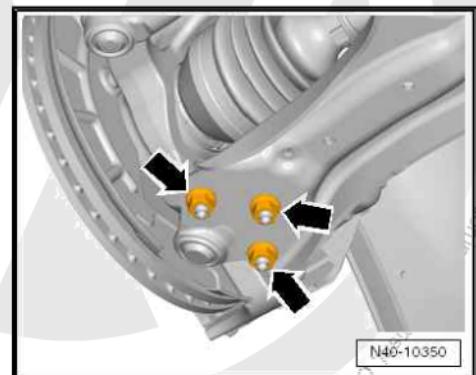
Continuation for vehicles with anti-roll bar:

- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

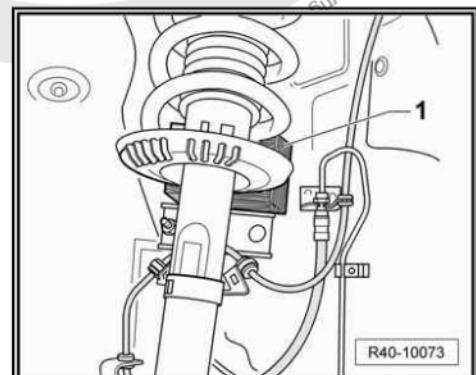
Continuation for all vehicles:



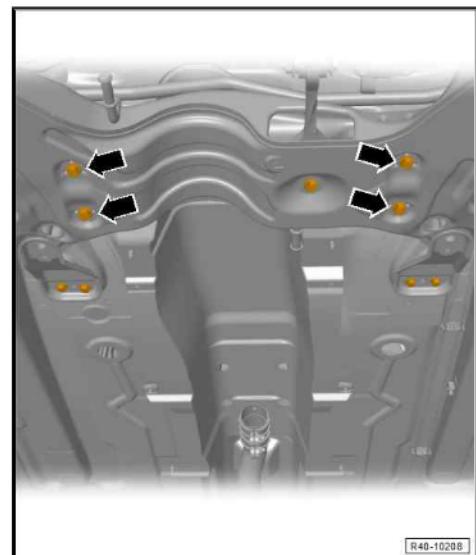
- Remove the mounting nuts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.



- Pull the suspension strut out and support it using a wood block -1- (for example).
- Remove the front exhaust tube close to the catalytic converter  
 ⇒ Engine; Rep. gr. 26 ; Exhaust system .



- Loosen the bolts -arrows- from the steering box on the auxiliary frame and, then, fasten it with a wire, for example.
- Position the auxiliary frame (assembly mounting)  
 ⇒ [page 65](#) .
- Lower the auxiliary frame Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- .





## 5.9.2 Installation

Installation is performed in reverse to removal sequence, considering the following:

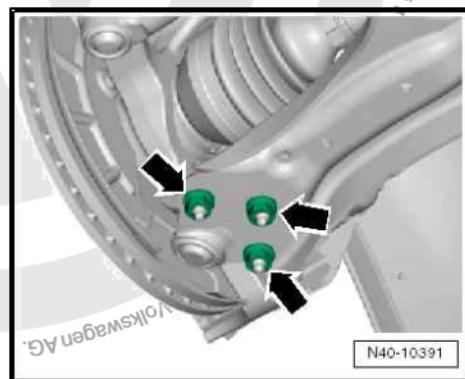


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

*Replace self-locking nuts and bolts subject to angular torque.*

- Position the auxiliary frame (assembly mounting) [⇒ page 65](#).
- Insert the swivel joint in the wishbone.
- Tighten union nuts -arrows to the swivel joint on the wishbone. Tightening torque, see [⇒ page 64](#).
- Install and tighten the fastening bolts of the steering box in the auxiliary frame. Tightening torque, see [⇒ page 64](#).
- Install the front exhaust tube ⇒ Engine; Rep. gr. 26 ; Exhaust system .
- Install and tighten the securing nut of the steering terminal. Tightening torque, see [⇒ page 64](#).
- Check the alignment [⇒ page 204](#)



### Tightening torques

Components	Tightening torque
Steering box to the auxiliary frame ◆ Use new fastening screws	50 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening nuts	40 Nm + 45°
Auxiliary frame to car body ◆ Use new fastening screws	70 Nm + 180°
Rear body support ◆ Use new fastening screws	20 Nm + 90°
Pendulum support to gearbox ◆ Use new fastening screws	30 Nm + 90°
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm



## 5.10 Auxiliary frame (assembly mounting) (04/13►) - position

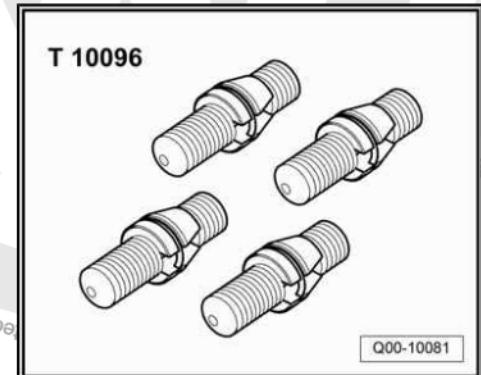


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

Special tools and workshop equipment required

- ◆ Location pins - T10096-



- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-



### 5.10.1 Removal



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*



### Note

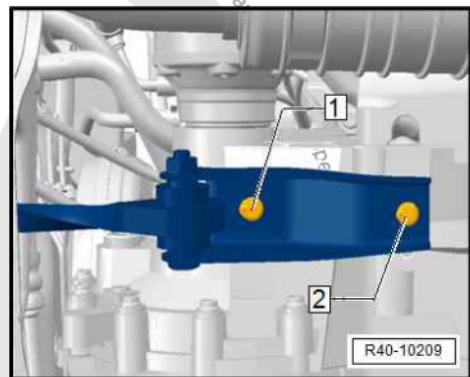
- ◆ This operation is only applicable to vehicles with "standard suspensions" and "elevated suspensions" with a wedge incorporated into the auxiliary frame (assembly mounting)
- ◆ For vehicles with a wedge incorporated into the vehicle body "elevated suspension", it is necessary to check whether geometrical alignment of the vehicle is necessary
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.



- Remove pendulum support bolts -1- and -2- from the gearbox.
- Place the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for EQ 7081 hydraulic jack - VAG 1359/2- over the auxiliary frame (assembly mounting).
- Clean the threads of the Location pins - T10096- .

The sequence of the following work stages must be obligatorily observed:

Continuation for vehicles with wedges incorporated into their auxiliary frames (assembly mountings)

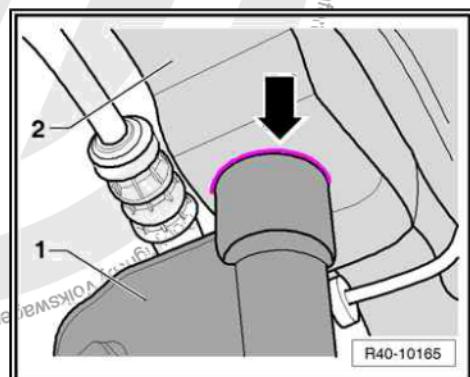


- Mark the position of the front fastening point on the vehicle body -arrow-, to facilitate later assembly (for example, use a marker pen).

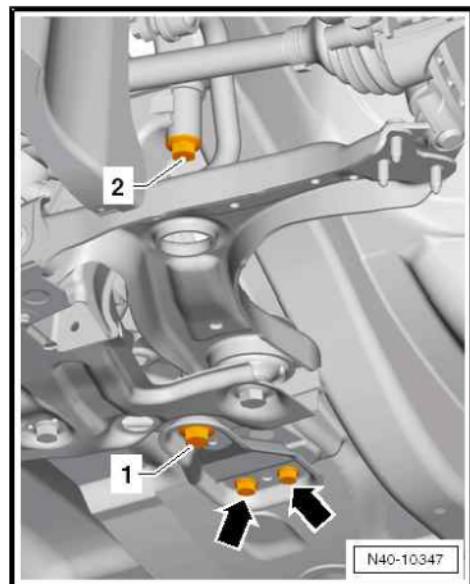
Continuation



*The Location pins - T10096- must only be tightened to a maximum of 20 Nm. Otherwise, the device thread will be damaged.*

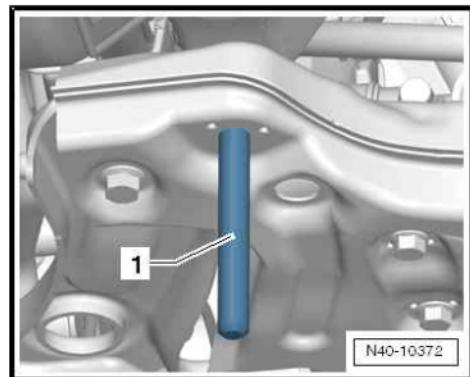


- Remove fastening bolts -2-, and replace them with Location pins - T10096- .
- Remove the mounting bolts -arrows-.
- Remove the fastening bolt -1- (one side only) and remove the support.
- Install the Location pin - T10096- and tighten it to the torque of 20 Nm.



- In the event of difficulties in installing the Location pin - T10096- , a Puller - 10-508- -1- should be used to facilitate the centralization of the bush to auxiliary frame (assembly mounting).
- The auxiliary frame (assembly mounting) positioning will be concluded when all 4 bolts have been replaced by the Location pins - T10096- .

Continuation for vehicles with wedges incorporated into their auxiliary frames (assembly mountings)

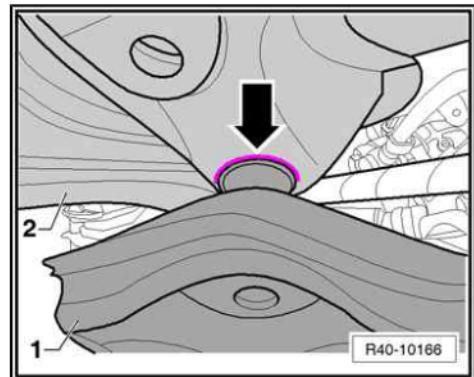




- Mark the position of the rear fastening point on the vehicle body -arrow-, to facilitate later assembly (for example, use a marker pen).

Continuation for all vehicles

- Carefully lower the auxiliary frame (assembly mounting) approximately 4 cm.



## 5.10.2 Installation

Installation is performed in reverse to removal sequence, considering the following:

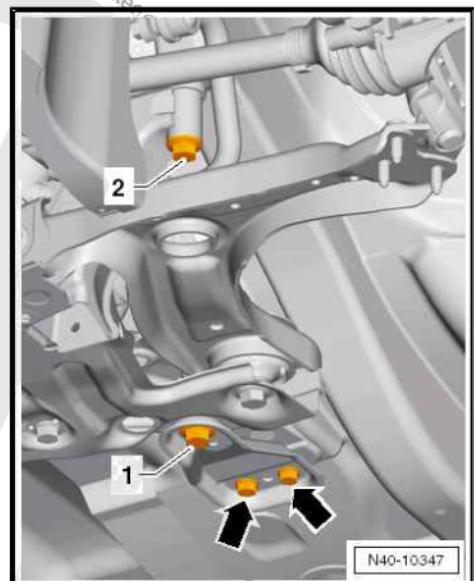


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ➤ page 204*

*Replace self-locking nuts and bolts subject to angular torque.*

- Carefully position the auxiliary frame (assembly mounting).
- Always remove the Location pins - T10096- one at a time, replacing it with a new bolt -1- and -2-.
- Install the support and tighten the fastening bolts -arrows-.
- Tighten the fastening bolts to the auxiliary frame (assembly mounting). Tightening torque, see ➤ page 67 .
- Check the alignment ➤ page 204



### Tightening torques

Components	Tightening torque
Steering box to the auxiliary frame <ul style="list-style-type: none"> <li>◆ Use new fastening screws</li> </ul>	50 Nm + 90°
Swivel joint to wishbone <ul style="list-style-type: none"> <li>◆ Use new fastening nuts</li> </ul>	40 Nm + 45°
Auxiliary frame to car body <ul style="list-style-type: none"> <li>◆ Use new fastening screws</li> </ul>	70 Nm + 180°
Rear body support <ul style="list-style-type: none"> <li>◆ Use new fastening screws</li> </ul>	20 Nm + 90°



Components	Tightening torque
Pendulum support to gearbox ◆ Use new fastening screws	30 Nm + 90°
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm

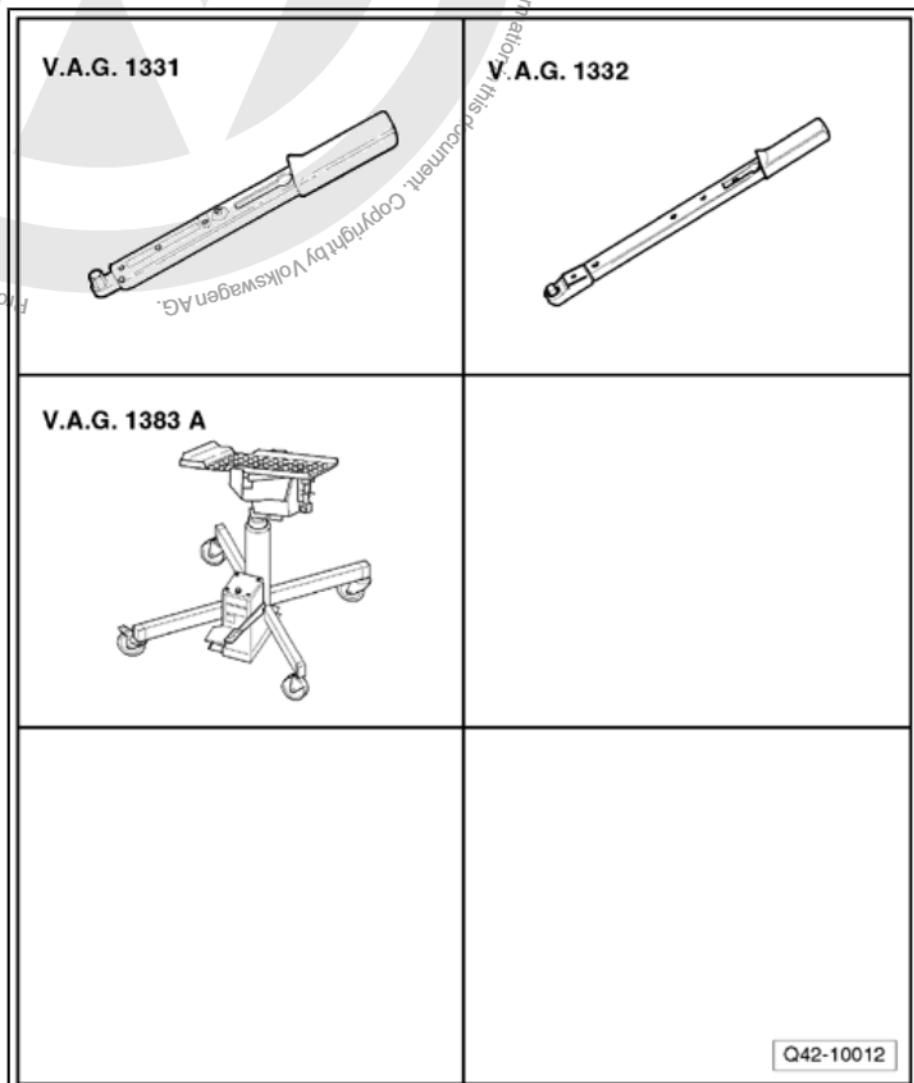
## 5.11 Anti-roll bar (04/13►) - remove and install



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

Special tools and workshop equipment required





- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A-  
 and Tray for hydraulic jack EQ 7081 - VAG 1359/2-

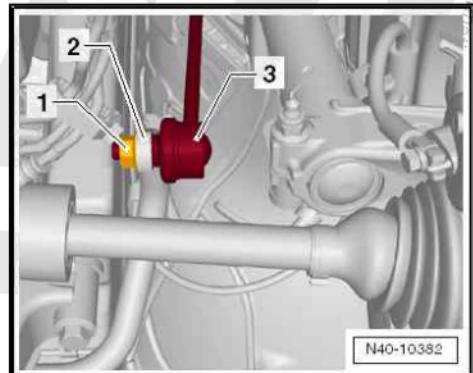
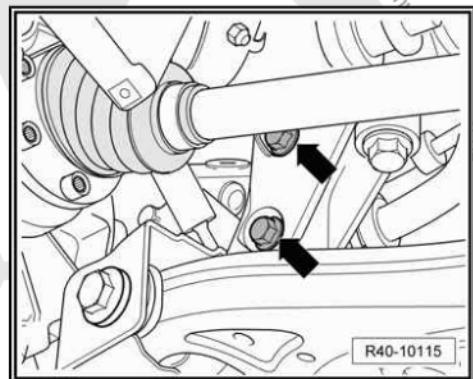
### 5.11.1 Removal



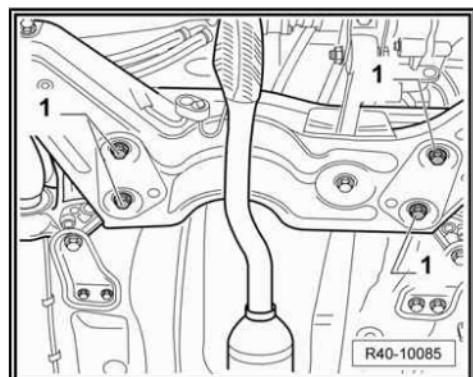
#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the front wheels.
- Remove the noise insulation, if any ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .
- Remove the securing bolts -arrows- (both sides).



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.



- Loosen the fastening bolts -1- for the steering box to auxiliary frame and fasten it to the body (using wire, for example).
- Position the auxiliary frame (assembly mounting) [⇒ page 38](#) .

Continuation:

- Remove the anti-roll bar by its side.



## 5.11.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

*Replace self-locking nuts and bolts subject to angular torque.*

- Install a new rubber bearing -1- on the anti-roll bar through the opening -arrow-.



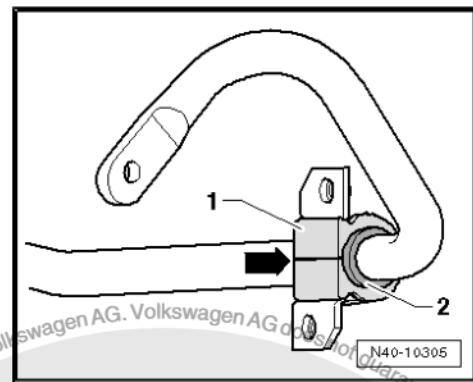
### Note

- ◆ Make sure that the rubber bearing exterior edge -1- touches the stop -2-.
- ◆ Depending on the version, the stop -2- may be located at right or left of the rubber bearing.

- Install the anti-roll bar and secure it to the console with clamps. Tightening torque, see [⇒ page 44](#).
- Place the auxiliary frame [⇒ page 38](#).
- Fasten the steering box to the auxiliary frame (assembly mounting). Tightening torque, see [⇒ page 44](#).
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#).
- Check alignment [⇒ page 204](#).

### Tightening torques

Components	Tightening torques
Console wishbone ◆ Use new fastening screws	20 Nm + 90°
Steering box to the auxiliary frame (sub-frame) ◆ Use new fastening screws	50 Nm + 90°





## 6 II - Wheel roller bearings (►04/13) - repair

### 6.1 Wheel roller bearings (►04/13) - assembly overview



#### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
⇒ [page 204](#)
- ◆ Soldering and straightening operations are not permitted on the suspension supporting components or on those components in which the wheels are mounted
- ◆ Always replace corroded bolts/nuts
- ◆ Always replace self-locking nuts and bolts subject to angular torque

1 - Drive shafts with constant velocity joint

- different versions
- See: ⇒ Electronic parts catalogue "ETKA"

2 - Suspension column

- Remove and install  
⇒ [page 116](#)

3 - Internal grooved bolt

- the tip on the hex head screw must point in direction of travel

4 - Internal hex head bolt

- 8 Nm

5 - Speed sensor

- Remove and install ⇒ Brake system; Rep. gr. 45 ; Anti-lock system (ABS)

6 - Hexagonal nut

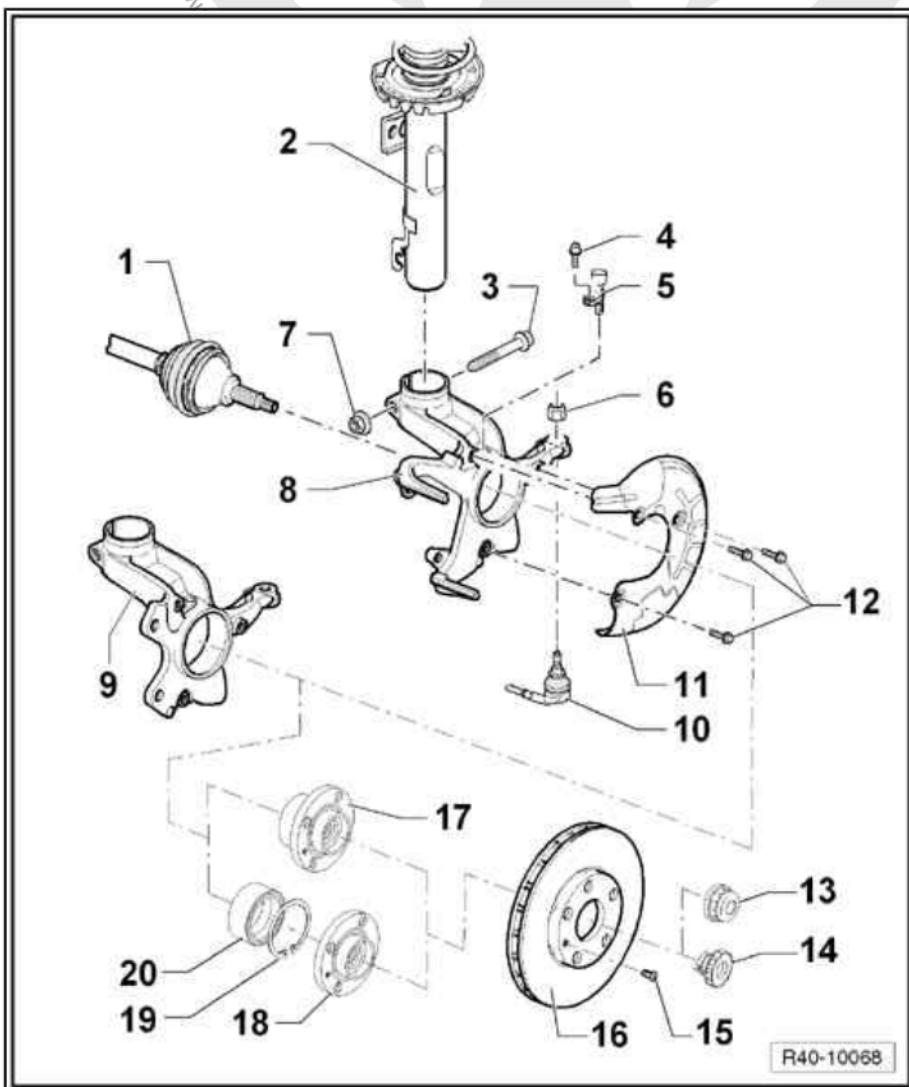
- Self-locking
- 20 Nm + 90°
- Replace once removed

7 - Hexagonal nut

- Self-locking
- 60 Nm + 90°
- Replace once removed

8 - Wheel roller bearing case

- For "FS II" and "FS III" brake callipers





- Different versions for 13" (FS II) and 14" (FS III) wheel running gear
- See: ⇒ Electronic parts catalogue "ETKA"

9 - Wheel roller bearing case

- different versions for 15" wheel running gear
- See: ⇒ Electronic parts catalogue "ETKA"

10 - Steering linkage bar terminal

11 - Disc guard

12 - Hexagonal bolt

- 10 Nm

13 - Grooved nut (dodecahedron)

To vehicles without ABS

- Replace once removed
- See: ⇒ Electronic parts catalogue "ETKA"
- Pre-tighten to 200 + 50 Nm, then loosen (turn back) 180°, and retighten to 50 Nm + 50°, consult [⇒ page 146](#)

14 - Grooved nut (dodecahedron)

For vehicles with ABS

- Replace once removed
- See: ⇒ Electronic parts catalogue "ETKA"
- Tightening torque for 14" and 15" wheels running gear (silver colour fastening nut) = 50 Nm + 45°, consult [⇒ page 146](#)

15 - Screw

- 4 Nm

16 - Ventilated brake disc

- Remove and install ⇒ Brake systems; Rep. gr. 46 ; Brakes - Mechanical systems .

17 - Wheel hub with roller bearing

For vehicles with ABS

- The ABS sensor ring is installed in the wheel hub
- Different versions for running gear with 13" (FS II brake caliper), 14" and 15" (FS III brake caliper) wheels
- See: ⇒ Electronic parts catalogue "ETKA"
- Remove (vehicles with 13" wheel running gear - FS-II brake caliper) [⇒ page 80](#)
- Remove (vehicles with 14" and 15" wheels running gear- FS-III brake caliper) [⇒ page 86](#)
- Replace, because it is destroyed when removed
- Install (vehicles with 13" wheel running gear - FS-II brake caliper) [⇒ page 85](#)
- Install (vehicles with 14" and 15" wheel running gear - FS-III brake caliper) [⇒ page 91](#)

18 - Wheel hub without roller bearing

To vehicles without ABS

- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install [⇒ page 73](#)

19 - Safety ring

To vehicles without ABS

- 72 x 2.5
- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install [⇒ page 73](#)



20 - Double ball bearing

To vehicles without ABS

- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install ⇒ [page 73](#)

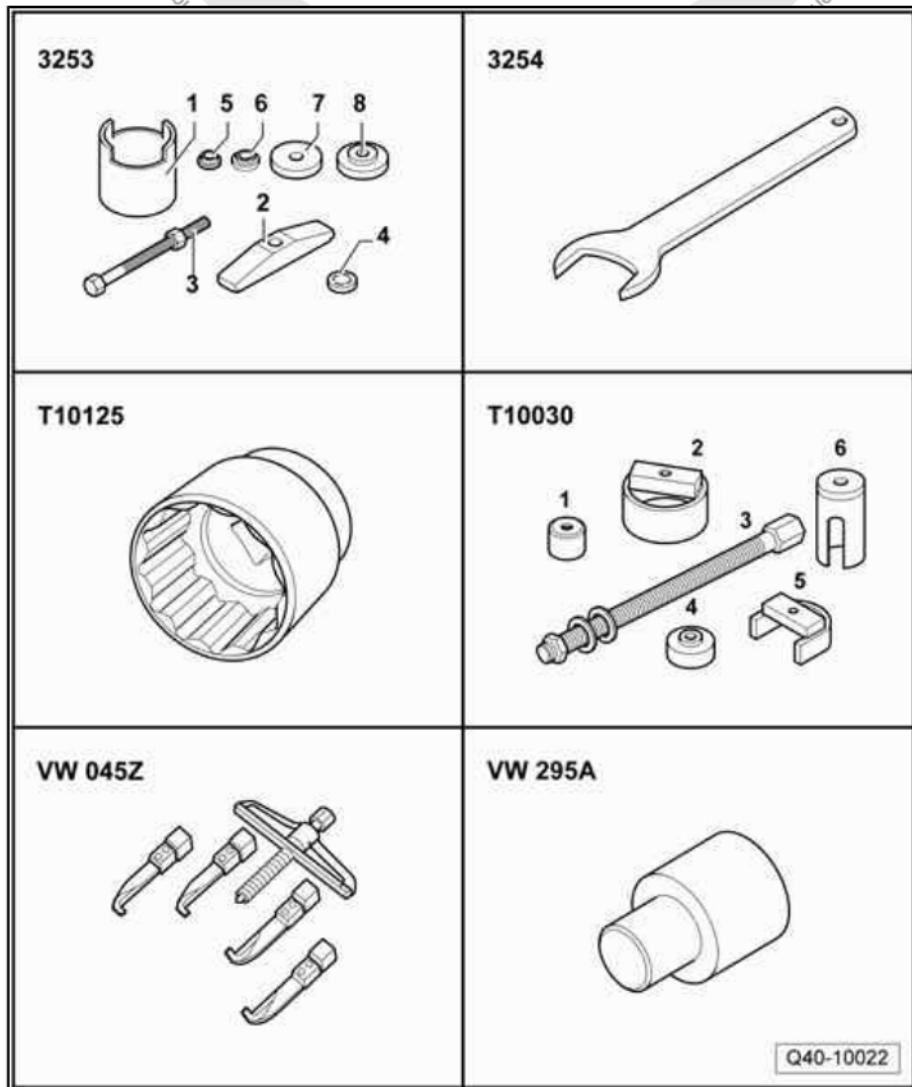
6.2      Wheel roller bearing for vehicles without  
ABS (►04/13) - remove and install



**WARNING**

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

Special tools and workshop equipment required

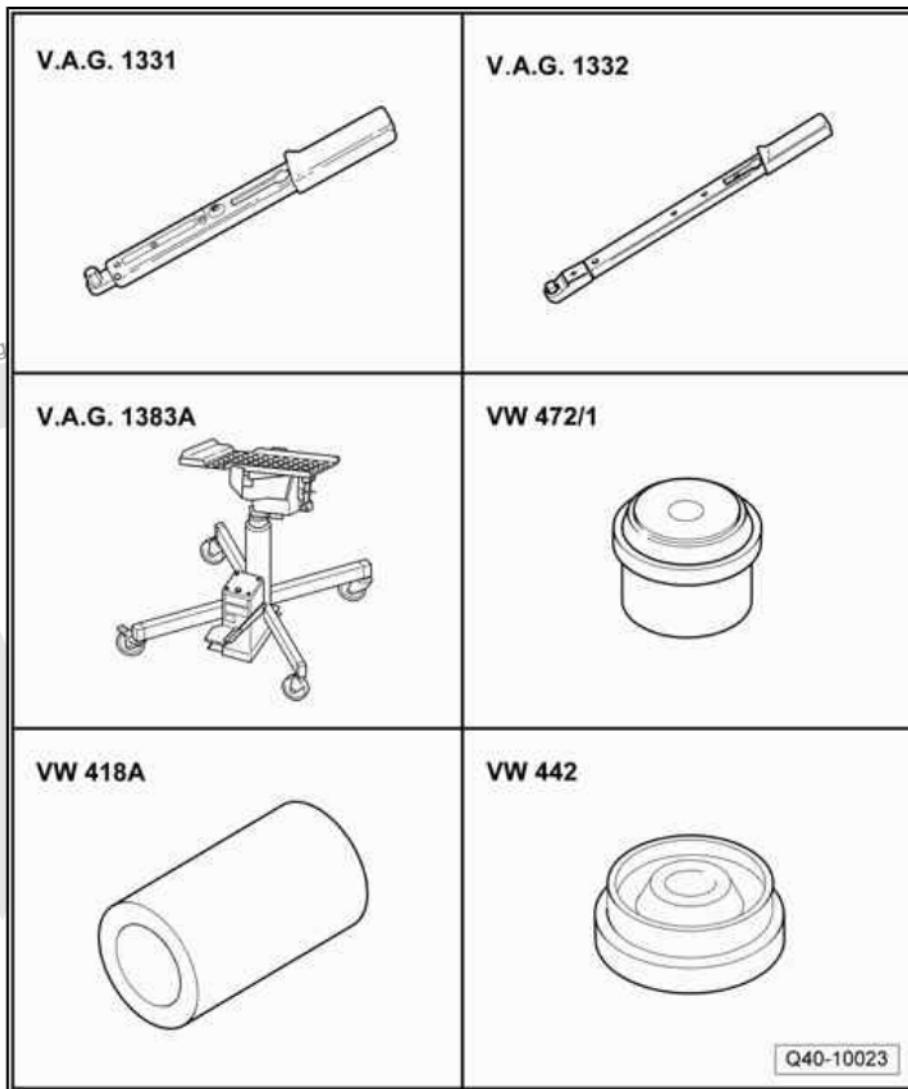


- ◆ Assembly tool - 3253-
- ◆ Spanner, 50 mm - 3254-



- ◆ 36 mm Grooved Socket - T 10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ 30 mm Grooved Socket (Gedore ref. D32-30)
- ◆ Device - T10030-
- ◆ Puller and Fitter KUKKO 20/10 - VW 045Z- and Claw - VW 045Z/1-
- ◆ Drift tool additional - VW 295A-

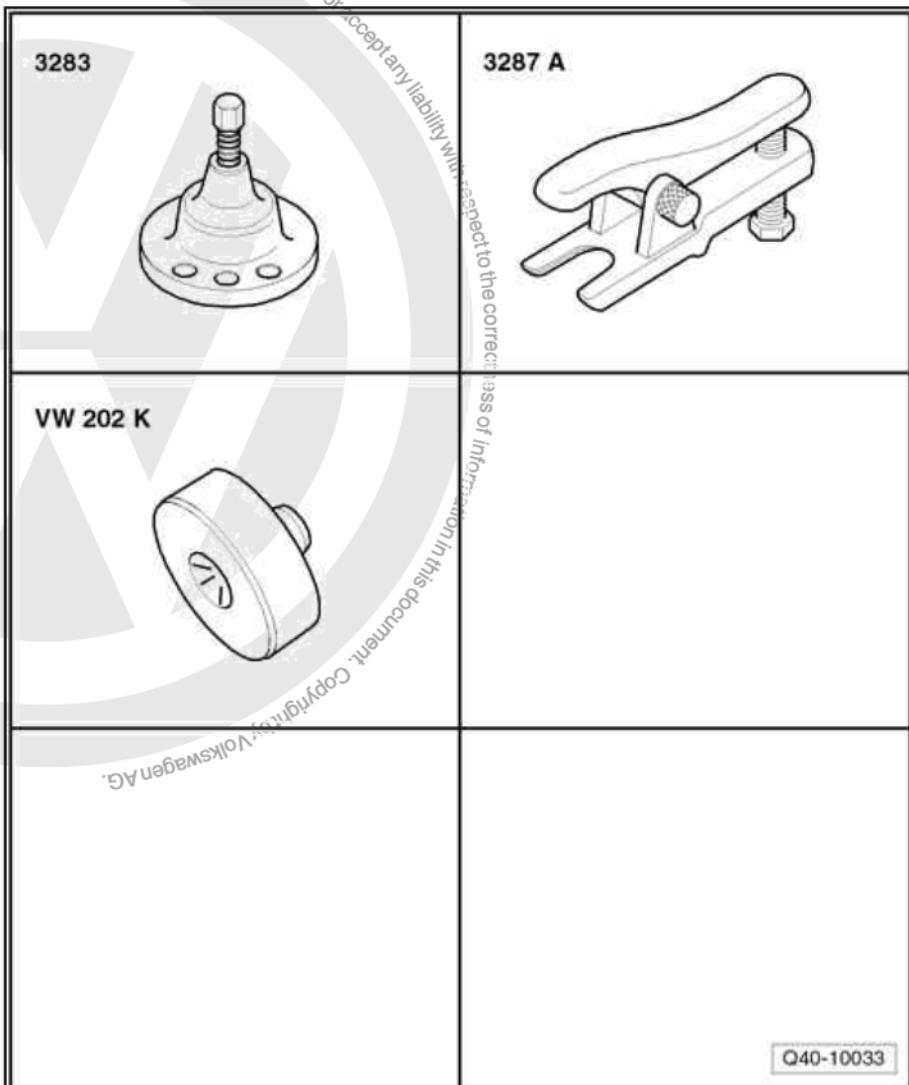
Special tools and workshop equipment required



- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm (1/2") - VAG 1332-
- ◆ Similar - EQ 7081 - Gearbox or engine + gearbox set jack - VAG 1383A-
- ◆ Thrust piece - VW 472/1-
- ◆ Press tube - VW 418A-
- ◆ Thrust piece - VW 442-



Special tools and workshop equipment required



- ◆ Puller - 3283-
- ◆ Puller - 3287A-
- ◆ Extraction base - VW 202K-

### 6.2.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Loosen the fastening nut (dodecahedron) from the drive shaft  
[⇒ page 146](#).
- Remove the front wheel.



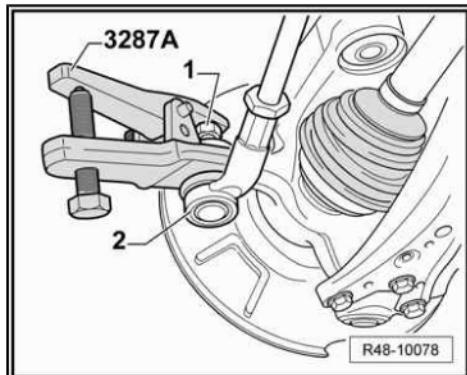
- Loosen the hexagonal nut -1- from the steering terminal.



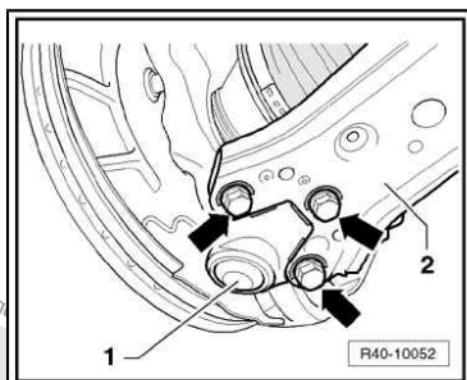
**WARNING**

*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .

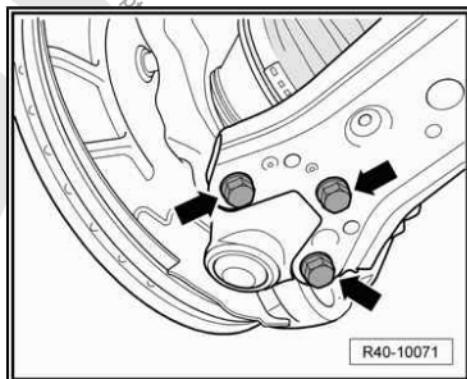


- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



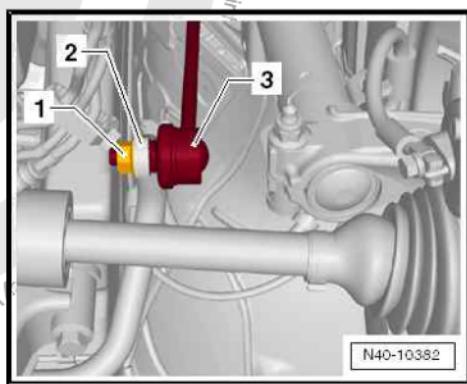
- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:

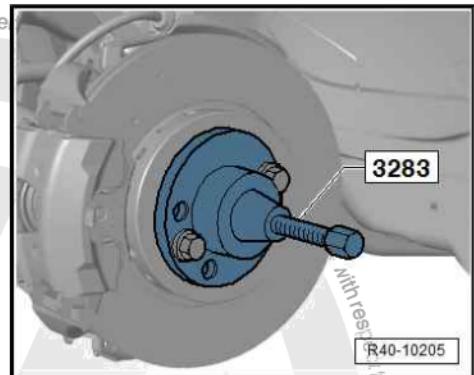




- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



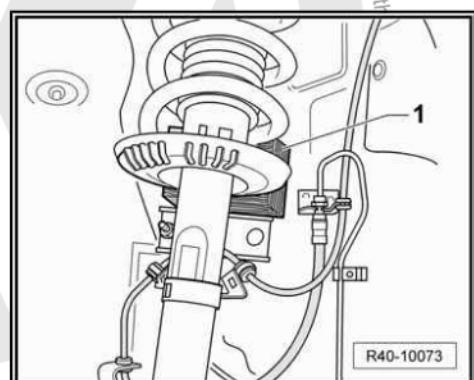
*While the drive shaft is being pressed outwards, observe if there is enough free space.*



- Remove the wheel roller bearing case with the shaft articulation out of the wishbone.
- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*



*Position the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- underneath (danger of accident from falling parts when extracting the wheel hub and the wheel roller bearing).*

## 6.2.2 Wheel roller bearing hub (►04/13) - remove

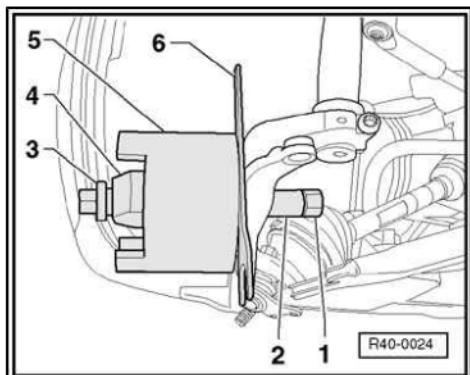


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [►page 204](#)*

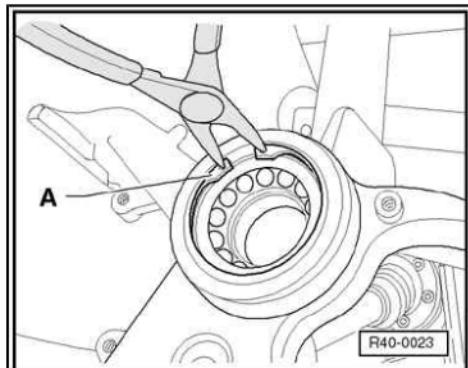
Install the removal tool

- 1 - Assembly device - 3253/3-
- 2 - Pressure tube - VW 418A-
- 3 - Assembly device - 3253/6-
- 4 - Assembly device - 3253/2-
- 5 - Assembly device - 3253/1-
- 6 - 50mm Spanner - 3254-



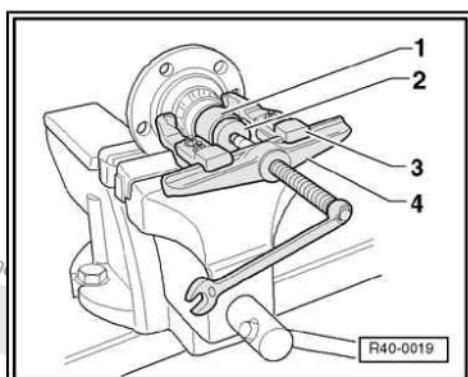


Remove the circlip -A- with pliers



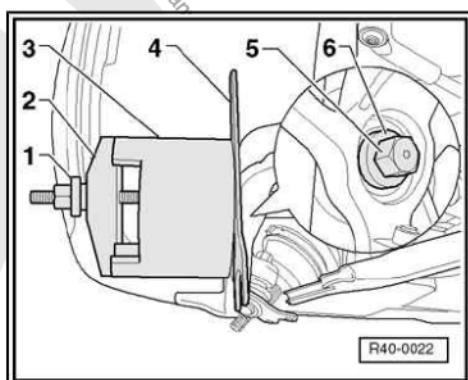
Remove the internal wheel roller bearing track

- 1 - Base - VW 295A-
- 2 - Extraction base - VW 202K-
- 3 - Extractor and Fitter KUKKO 20/10 or KUKKO 20/10 - VW 045Z/1-
- 4 - Extractor and Fitter KUKKO 20/10 or KUKKO 20/10 - VW 045Z-



Remove the wheel roller bearing by removing it from the wheel roller bearing case

- 1 - Assembly device - 3253/5-
- 2 - Assembly device - 3253/2-
- 3 - Assembly device - 3253/1-
- 4 - 50mm Spanner - 3254-
- 5 - Assembly device - 3253/6-
- 6 - Assembly device - 3253/3-



### 6.2.3 Installation



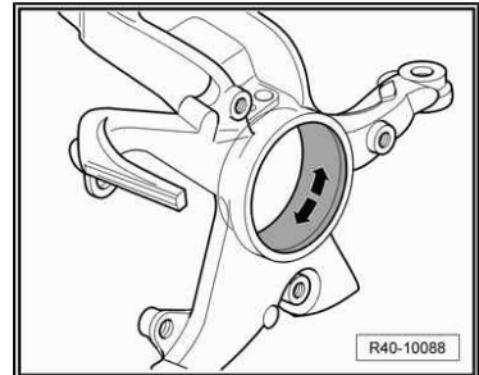
#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Clean the residues from the wheel roller bearing housing in the wheel roller bearing case.



- Lubricate the wheel roller bearing housing surface with Moly grease - G 052 723 A2- . Refer to the ⇒ Chemicals Manual .



R40-10088

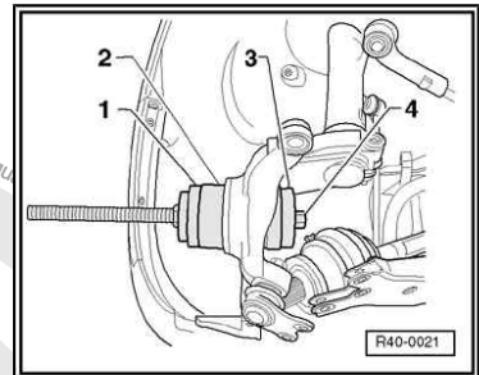
Install the roller bearing in the wheel bearing case

- 1 - Pressure base - VW 442-
- 2 - Wheel roller bearing
- 3 - Installation device - T10064/4-
- 4 - Device - T10030/3-



Note

*Pay attention to the correct alignment of the roller bearing in relation to the roller bearing case*



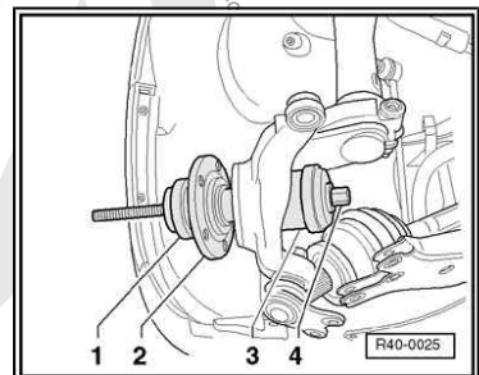
R40-0021

- Install the circlip in the wheel roller bearing case.

Install the wheel hub in the wheel roller bearing

- 1 - Pressure base - VW 442-
- 2 - Wheel hub
- 3 - Pressure base - VW 472/1-
- 4 - Device - T10030/3-

- Clean the surfaces from the thread and the toothed area.



R40-0025



- Lubricate the toothed area -1- using Molybdenum Paste - G 052 751 A1- . Refer to the ⇒ Chemicals Manual .
- Lubricate the thread on the axle tip -2- and the thread on the fastening nut using Micro oil . Refer to the ⇒ Chemicals Manual .
- Install the drive shaft on the wheel roller bearing case.



Note

*Check if the boots are not damaged or twisted.*



#### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

- Install the fastening screws (screws on the old markings) for the wishbone swivel guide. Tightening torque, see ⇒ [page 80](#) .
- Install disc protector, brake disc and disc brake calliper ⇒ Brake systems; Rep. gr. 46 ; Front brakes - repair .
- Install the coupling rod. Tightening torque, see ⇒ [page 80](#) .
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see ⇒ [page 80](#) .
- Install the front wheel and tighten the screws. Tightening torque, see ⇒ [page 203](#) .
- Install and tighten the securing nut (dodecahedron). Tightening torque, see ⇒ [page 146](#) .
- Check alignment ⇒ [page 204](#) .

#### Tightening torques

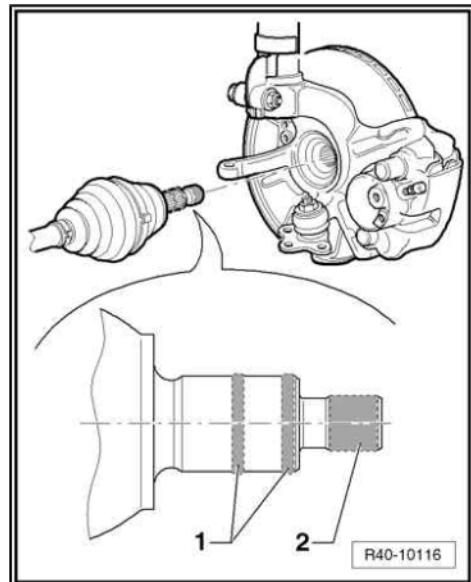
Components	Tightening torques
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm

### 6.3 Front wheel hub with wheel bearing for 13" wheel running gear (FS II ▶04/13) - remove and install



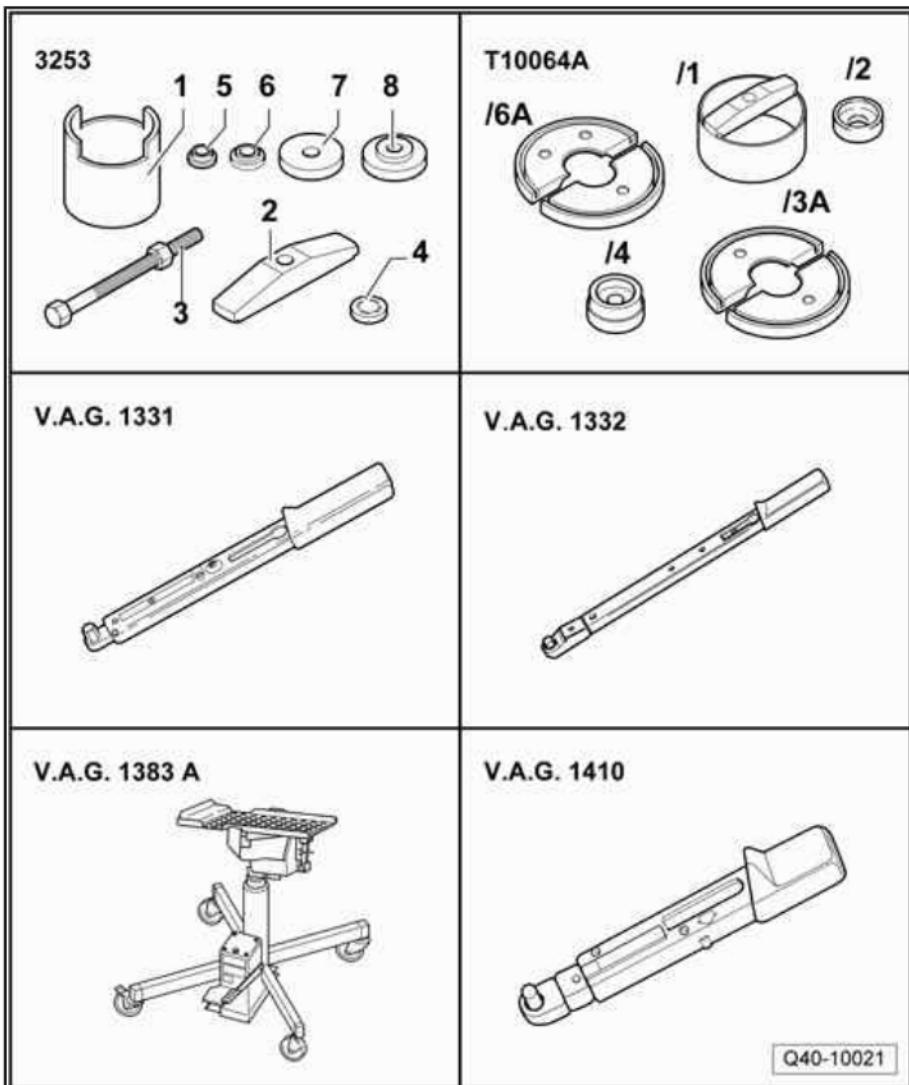
#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*





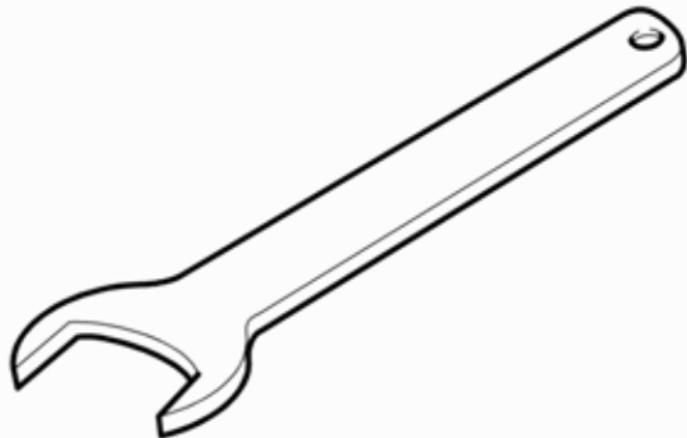
### Special tools and workshop equipment required



- ◆ Assembly tool - 3253-
- ◆ Installation tool T10064-
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Torque wrench - 4 to 20 Nm (fit. 3/8") - VAG 1410-



3254



Q00-10066

- ◆ 50mm spanner - 3254-

### 6.3.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

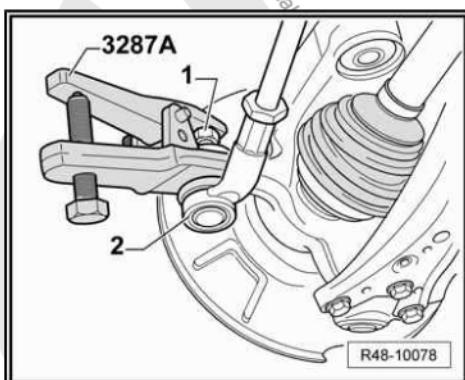
- Loosen the fastening nut (dodecahedron) from the drive shaft [⇒ page 146](#) .
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



#### WARNING

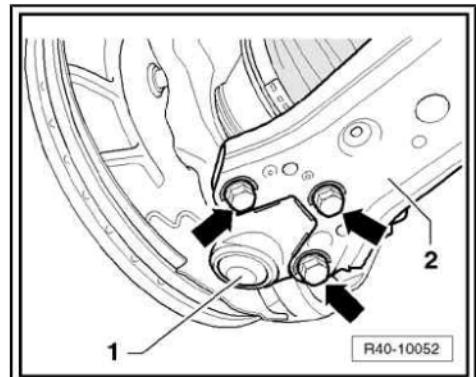
*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .





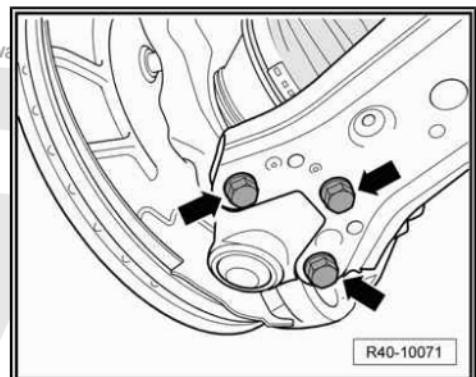
- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



R40-10052

- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

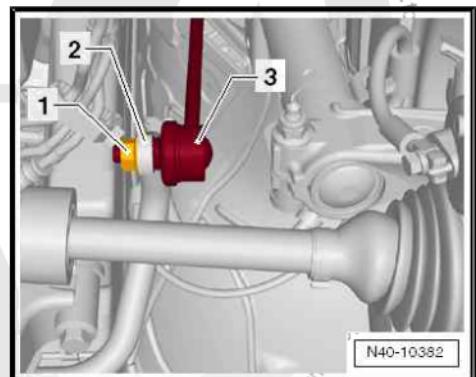
Continuation for vehicles with anti-roll bar:



R40-10071

- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:



N40-10382

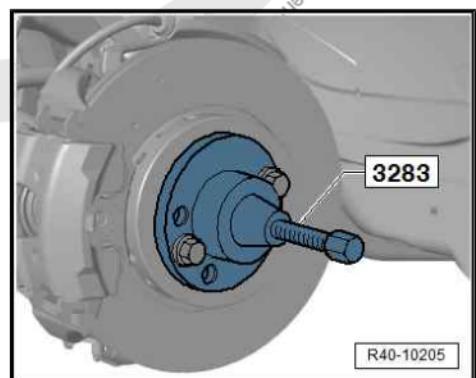
- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



Note

*While the drive shaft is being pressed outwards, observe if there is enough free space.*

- Remove the wheel roller bearing case with the shaft articulation out of the wishbone.



R40-10205

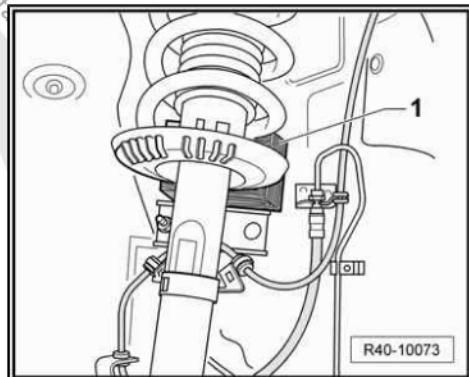


- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



Note

*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*



R40-10073

- Remove the disc brake calliper and tie it to the body with wire Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the brake disc and protective cover => Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the speed sensor on the front axle => Brake system; Rep. gr. 45 ; Anti-lock system (ABS) .



Note

*Position the Gearbox or engine/gearbox set jack or EQ 7087- VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- underneath (danger of accident from falling parts when extracting the wheel hub and the wheel roller bearing).*

### 6.3.2 Hub with wheel bearing (►04/13) - remove



**WARNING**

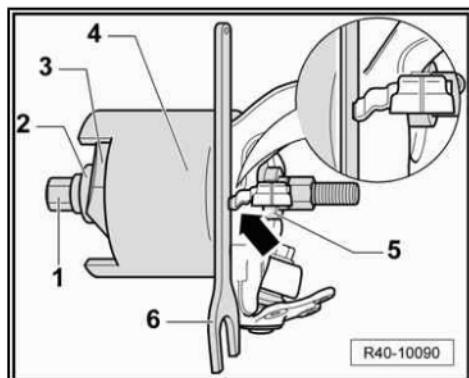
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [=> page 204](#)*

- Install the separating device -1- between the wheel roller bearing case and the wheel hub, and pre-tension it.

Installation position: The plain sides of the plates face the wheel hub side.

- Hold the device and remove the wheel hub with the wheel bearing.

- 1 - Assembly device - 3253/3-
- 2 - Assembly device - 3253/5-
- 3 - Assembly device - 3253/2-
- 4 - Assembly device - 3253/1-
- 5 - Assembly device - 3253/6-
- 6 - 50mm Spanner - 3254-



R40-10090



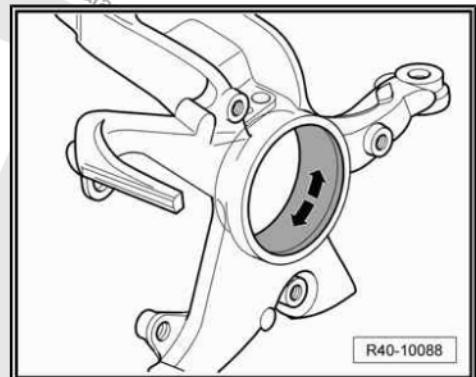
### 6.3.3 Hub with wheel bearing (►04/13) - install



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

- Remove residues from the drilling retaining washer and the wheel roller bearing case groove.
- Clean the suspension column hole.
- Lubricate the wheel roller bearing housing surface with Molybdenum Grease - G 052 723 A2-. Refer to the ⇒ Chemicals Manual .



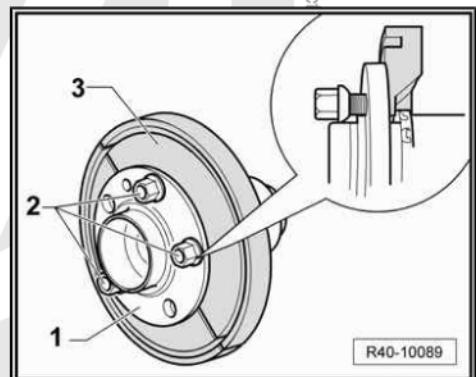
- Install the Claws - T10064/6A- to the wheel hub with wheel bearing.

1 - Wheel hub with wheel roller bearing  
 2 - Wheel bolts  
 3 - Installation device - T 10064/6A-



#### Note

*The wheel bolts -2- must not protrude from the back of the claws of the Installation device - T 10064/6A-*



- Install the wheel hub with wheel roller bearing in the wheel roller bearing case.

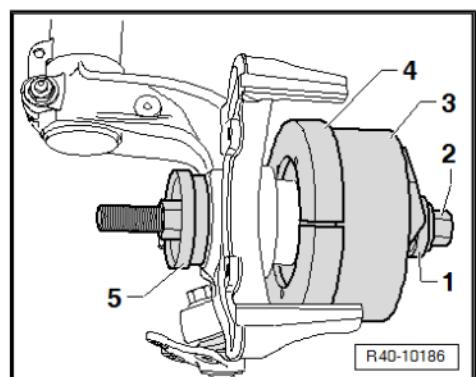


#### Note

*When installing, do not tilt the wheel hub with wheel roller bearing*

- Install the wheel hub with wheel roller bearing until the retaining washer fits audibly.

1 - Assembly device - 3253/5-  
 2 - Assembly device - 3253/3-  
 3 - Installation device - T10064/1-  
 4 - Installation device - T10064/6A-  
 5 - Installation device - T10064/4-





- Loosen the claws from Installation device - T10064/6A- from wheel hub with wheel roller bearing.

1 - Wheel hub with wheel roller bearing

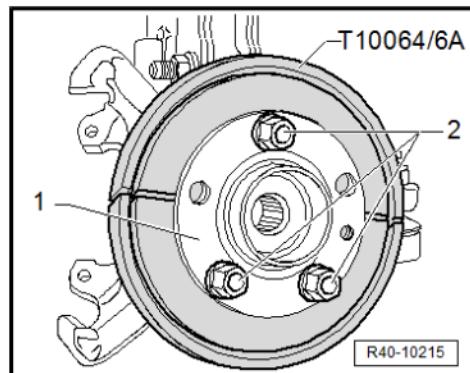
2 - Wheel bolts

- Install the drive shaft in the wheel roller bearing.



Note

*Check if the boots are not damaged or twisted.*



**WARNING**

*Replace self-locking nuts and bolts subject to angular torque.*

- Install the fastening screws (screws on the old markings) for the wishbone swivel guide. Tightening torque, see [⇒ page 86](#).
- Install disc protector, brake disc and disc brake calliper ⇒ Brake systems; Rep. gr. 46 ; Front brakes - repair .
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see [⇒ page 86](#).
- Install the coupling rod. Tightening torque, see [⇒ page 86](#).
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#).
- Install and tighten the securing nut (dodecahedron). Tightening torque, see [⇒ page 146](#).
- Check alignment [⇒ page 204](#).

#### Tightening torques

Components	Tightening torques
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm

## 6.4 Front wheel hub with wheel bearing for 14" and 15" wheels running gear (FS III ➤04/13)- remove and install



**WARNING**

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*



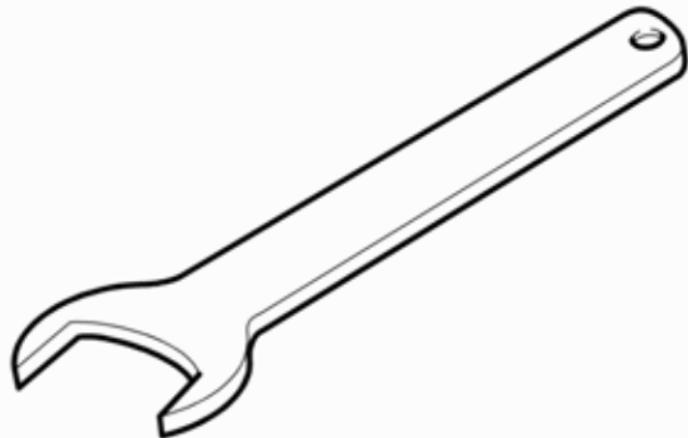
Special tools and workshop equipment required

<p>3253</p>	<p>T10064A</p>
<p>V.A.G. 1331</p>	<p>V.A.G. 1332</p>
<p>V.A.G. 1383 A</p>	<p>V.A.G. 1410</p>

- ◆ Assembly tool - 3253-
- ◆ Installation tool - T 10064-
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Torque wrench - 4 to 20 Nm (fit. 3/8") - VAG 1410-



3254



Q00-10066

- ◆ 50 mm spanner - 3254-

#### 6.4.1 Removal



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

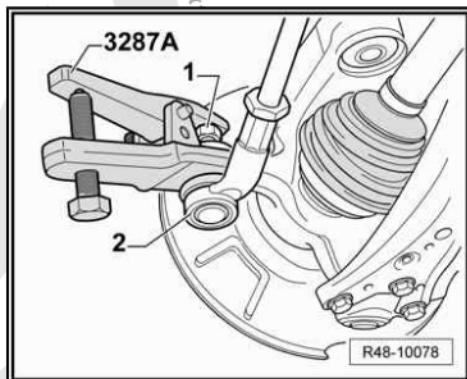
- Loosen the fastening nut (dodecahedron) from the drive shaft [⇒ page 146](#) .
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



##### WARNING

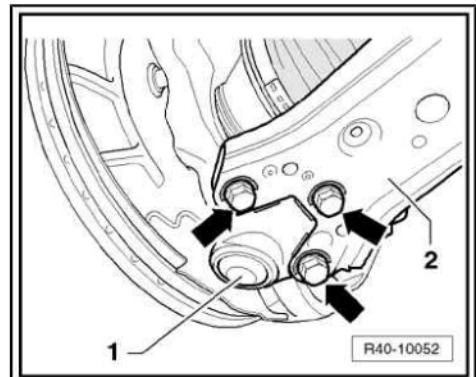
*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .





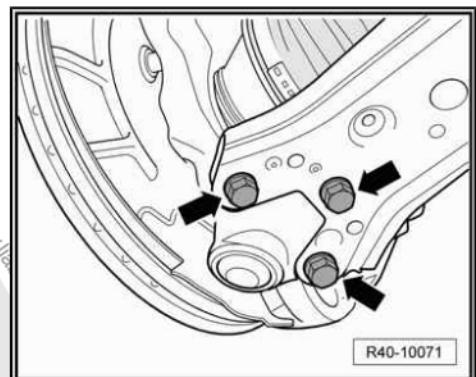
- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



R40-10052

- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:

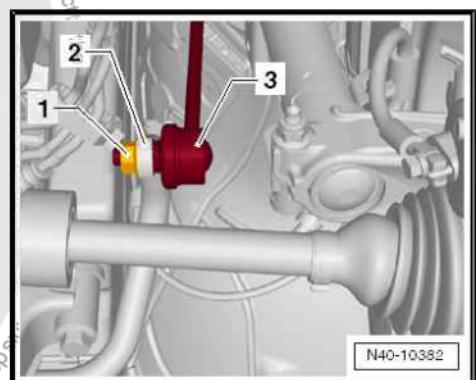


R40-10071

Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.

Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:



N40-10382

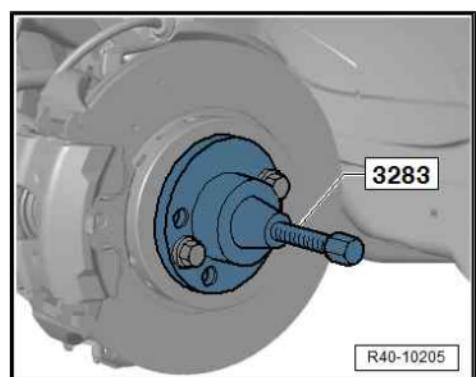
- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



Note

*While the drive shaft is being pressed outwards, observe if there is enough free space.*

- Remove the wheel roller bearing case with the shaft articulation out of the wishbone.



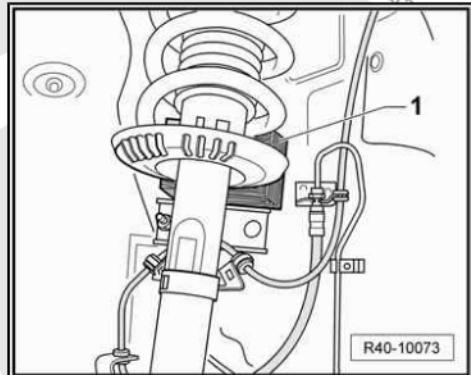
R40-10205



- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*



- Remove the disc brake calliper and tie it to the body with wire  
⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the brake disc and protective cover ⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the speed sensor on the front axle ⇒ Brake system; Rep. gr. 45 ; Anti-lock system (ABS) .



*Position the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- underneath (danger of accident from falling parts when extracting the wheel hub and the wheel roller bearing).*

#### 6.4.2 Hub with wheel bearing (►04/13) - remove



##### WARNING

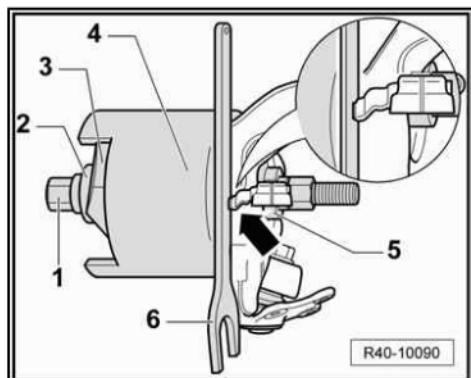
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ page 204*

- Install the separating device -1- between the wheel roller bearing case and the wheel hub, and pre-tension it.

Installation position: The plain sides of the plates face the wheel hub side.

- Hold the device and remove the wheel hub with the wheel bearing.

- 1 - Assembly device - 3253/3-
- 2 - Assembly device - 3253/5-
- 3 - Assembly device - 3253/2-
- 4 - Assembly device - 3253/1-
- 5 - Assembly device - 3253/6-
- 6 - 50 mm Spanner - 3254-





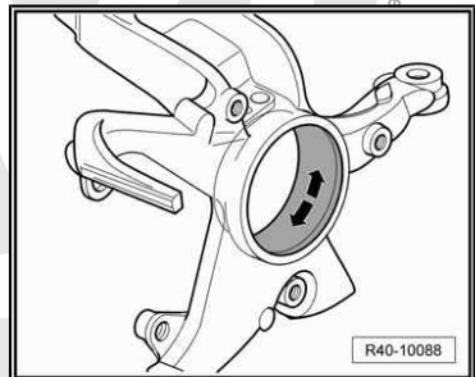
### 6.4.3 Hub with wheel bearing (►04/13) - install



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

- Remove residues from the drilling retaining washer and the wheel roller bearing case groove.
- Clean the suspension column hole.
- Lubricate the wheel roller bearing housing surface with Molybdenum Grease - G 052 723 A2-. See the ⇒ Chemicals Manual .



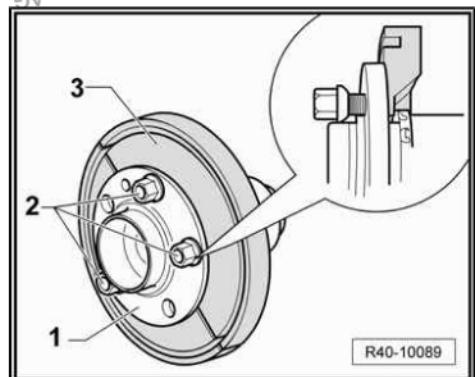
- Install the Claws - T10064/6A- to the wheel hub with wheel bearing.

- 1 - Wheel hub with wheel roller bearing
- 2 - Wheel bolts
- 3 - Installation device - T10064/6A-



#### Note

*The wheel bolts -2- must not protrude from the back of the claws of the Installation device - T 10064/6A-*



- Install wheel hub with wheel bearing in the wheel bearing case.

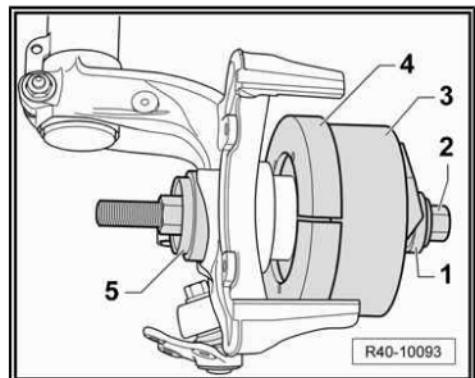


#### Note

*When installing, do not tilt the wheel hub with wheel roller bearing*

- Install the wheel hub with wheel roller bearing until the retaining washer fits audibly.

- 1 - Assembly device - 3253/5-
- 2 - Assembly device - 3253/3-
- 3 - Installation device - T 10064/1-
- 4 - Installation device - T10064/6A-
- 5 - Installation device - T10064/4-





- Release the Claws - T10064/6A- from the wheel hub with wheel bearing.

1 - Wheel hub with wheel roller bearing

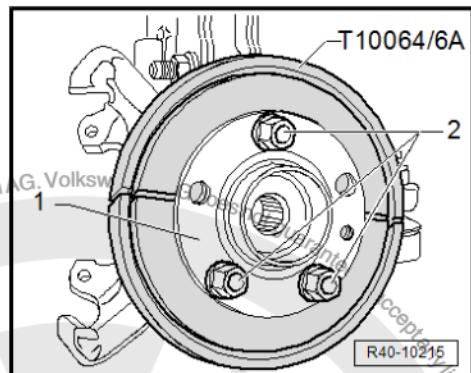
2 - Wheel bolts

- Install the drive shaft on the wheel roller bearing case.



Note

*Check if the boots are not damaged or twisted.*



#### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

- Install the fastening screws (screws on the old markings) for the wishbone swivel guide. Tightening torque, see [⇒ page 92](#) .
- Install disc protector, brake disc and disc brake calliper ⇒ Brake systems; Rep. gr. 46 ; Front brakes - repair .
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see [⇒ page 92](#) .
- Install the coupling rod. Tightening torque, see [⇒ page 92](#) .
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#)
- Install and tighten the securing nut (dodecahedron). Tightening torque, see [⇒ page 146](#) .
- Check alignment [⇒ page 204](#) .

#### Tightening torques

Components	Tightening torques
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm



## 7 II - Wheel roller bearings (04/13►) - repair

### 7.1 Wheel roller bearings (04/13►) - assembly overview



#### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
[⇒ page 204](#)
- ◆ Soldering and straightening operations are not permitted on the suspension supporting components or on those components in which the wheels are mounted
- ◆ Always replace corroded bolts/nuts
- ◆ Always replace self-locking nuts and bolts subject to angular torque

#### 1 - Drive shafts with constant velocity joint

- different versions
- See: ⇒ Electronic parts catalogue "ETKA"

#### 2 - Suspension column

- Remove and install  
[⇒ page 126](#)

#### 3 - Internal grooved bolt

- the tip on the hex head screw must point in direction of travel

#### 4 - Internal hex head bolt

- 8 Nm

#### 5 - Speed sensor

- Remove and install ⇒ Brake system; Rep. gr. 45 ; Anti-lock system (ABS)

#### 6 - Hexagonal nut

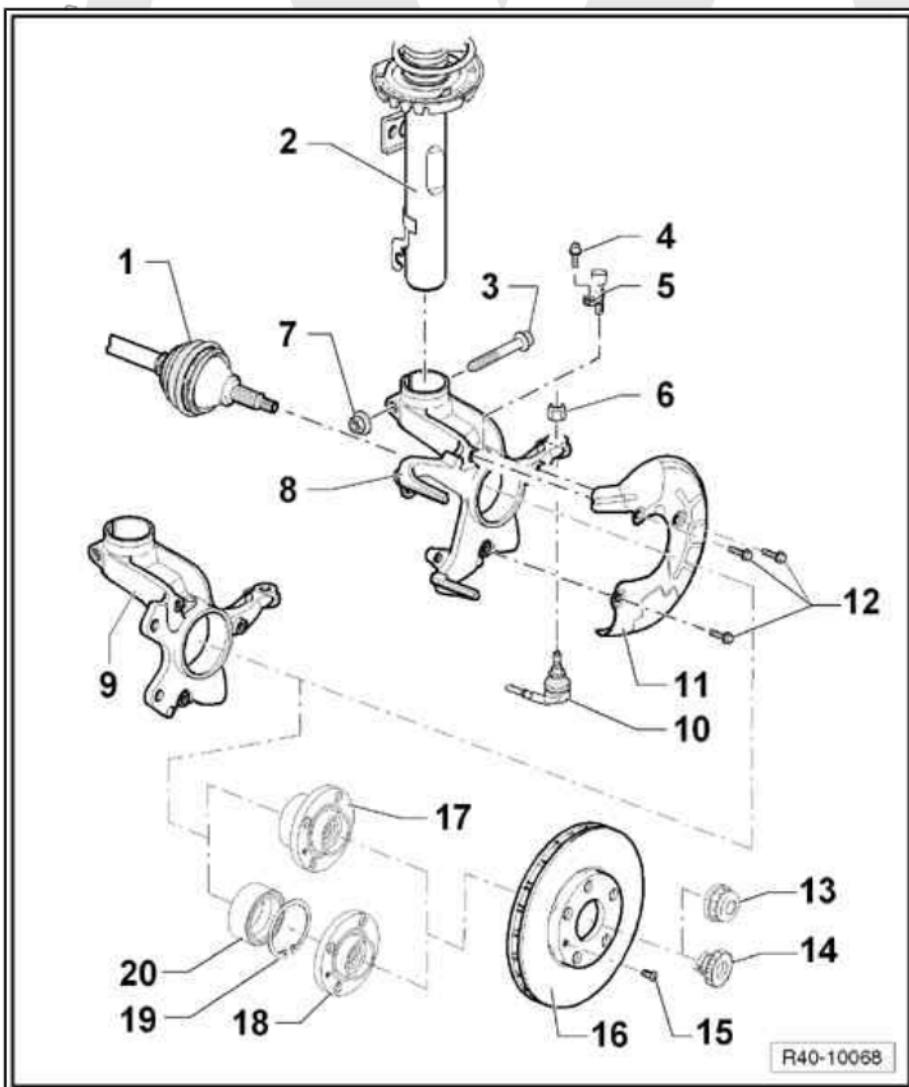
- Self-locking
- 20 Nm + 90°
- Replace once removed

#### 7 - Hexagonal nut

- Self-locking
- 60 Nm + 90°
- Replace once removed

#### 8 - Wheel roller bearing case

- For "FS II" and "FS III" brake callipers



R40-10068



- Different versions for 13" (FS II) and 14" (FS III) wheel running gear
- See: ⇒ Electronic parts catalogue "ETKA"

#### 9 - Wheel roller bearing case

- different versions for 15" wheel running gear
- See: ⇒ Electronic parts catalogue "ETKA"

#### 10 - Steering linkage bar terminal

#### 11 - Disc guard

#### 12 - Hexagonal bolt

- 10 Nm

#### 13 - Grooved nut (dodecahedron)

#### To vehicles without ABS

- Replace once removed
- See: ⇒ Electronic parts catalogue "ETKA"
- Pre-tighten to 200 + 50 Nm, then loosen (turn back) 180°, and retighten to 50 Nm + 50°, consult [⇒ page 146](#)

#### 14 - Grooved nut (dodecahedron)

#### For vehicles with ABS

- Replace once removed
- See: ⇒ Electronic parts catalogue "ETKA"
- Tightening torque for 14" and 15" wheels running gear - (FS III brake caliper - silver colour fastening nut) = 50 Nm + 45°, consult [⇒ page 146](#)

#### 15 - Screw

- 4 Nm

#### 16 - Ventilated brake disc

- Remove and install ⇒ [Brake systems; Rep. gr. 46 ; Brakes - Mechanical systems](#) .

#### 17 - Wheel hub with roller bearing

#### For vehicles with ABS

- The ABS sensor ring is installed in the wheel hub
- Different versions for running gear with 13" (FS II brake caliper), 14" and 15" (FS III brake caliper) wheels
- See: ⇒ Electronic parts catalogue "ETKA"
- Remove (Vehicles with 13" wheel running gear - FS-II brake caliper) [⇒ page 80](#)
- Remove (Vehicles with 14" and 15" wheels running gear - FS-III brake caliper) [⇒ page 86](#)
- Replace, because it is destroyed when removed
- Install (Vehicles with 13" wheel running gear - FS-II brake caliper) [⇒ page 85](#)
- Install (Vehicles with 14" and 15" wheel running gear - FS-III brake caliper) [⇒ page 91](#)

#### 18 - Wheel hub without roller bearing

#### To vehicles without ABS

- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install [⇒ page 73](#)

#### 19 - Safety ring

#### To vehicles without ABS

- 72 x 2.5
- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install [⇒ page 73](#)



20 - Double ball bearing

To vehicles without ABS

- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install ⇒ [page 73](#)

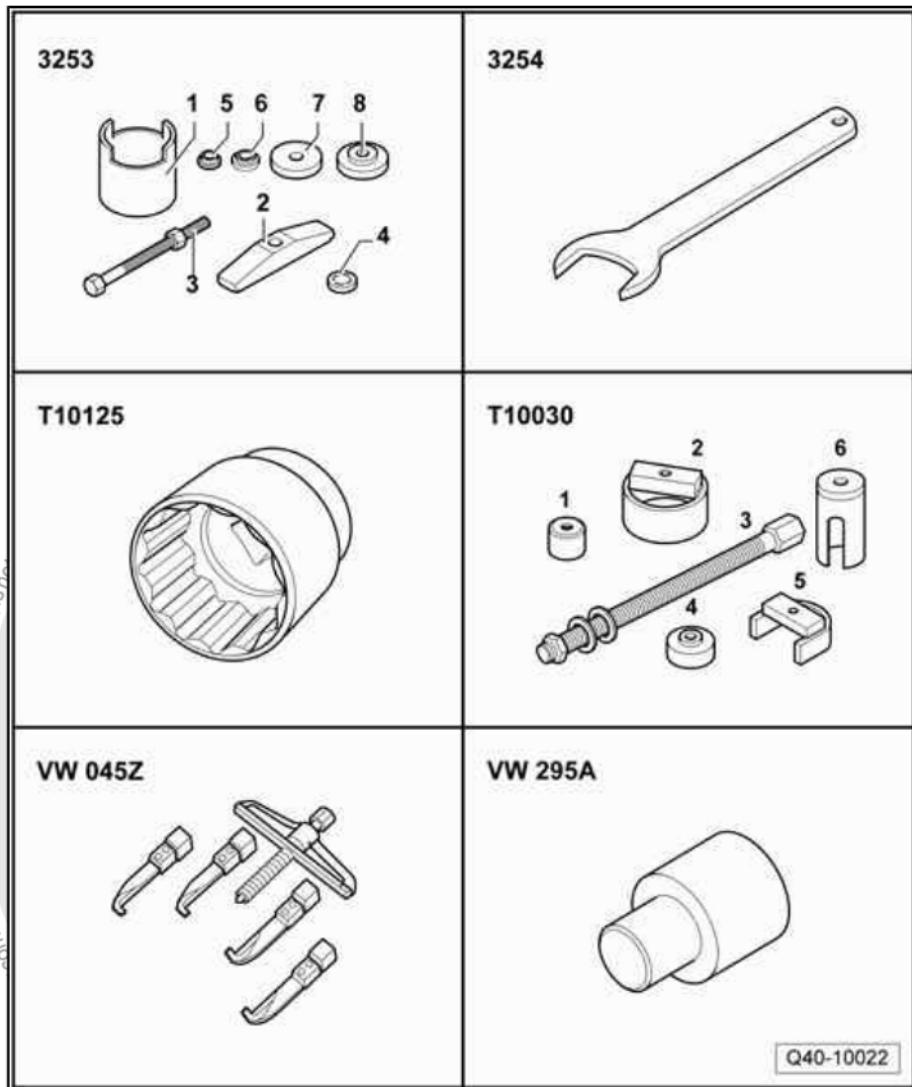
7.2      Wheel roller bearing for vehicles without  
 ABS (04/13 ➤) - remove and install



**WARNING**

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

Special tools and workshop equipment required



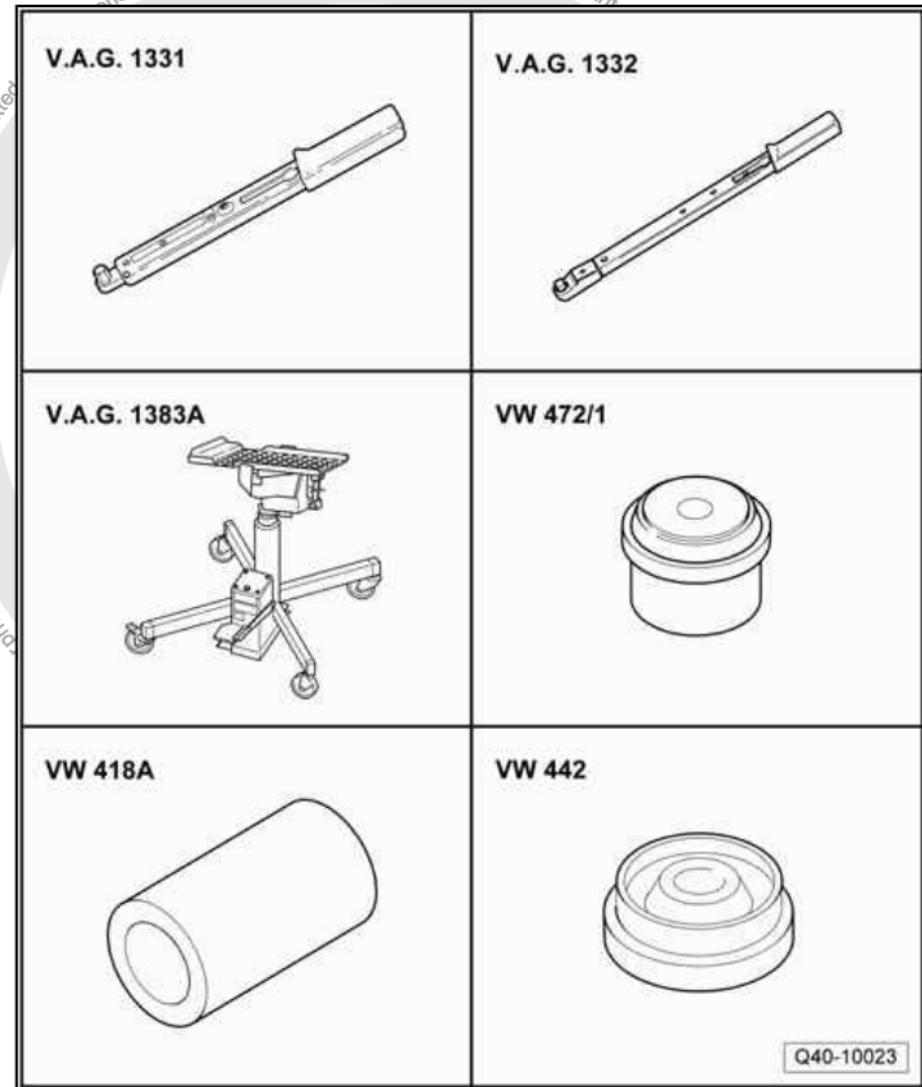
- ◆ Assembly tool - 3253-
- ◆ Spanner, 50 mm - 3254-

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- ◆ 36 mm Grooved Socket - T 10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ 30 mm Grooved Socket (Gedore ref. D32-30)
- ◆ Device - T10030-
- ◆ Puller and Fitter KUKKO 20/10 - VW 045Z- and Claw - VW 045Z/1-
- ◆ Drift tool additional - VW 295A-

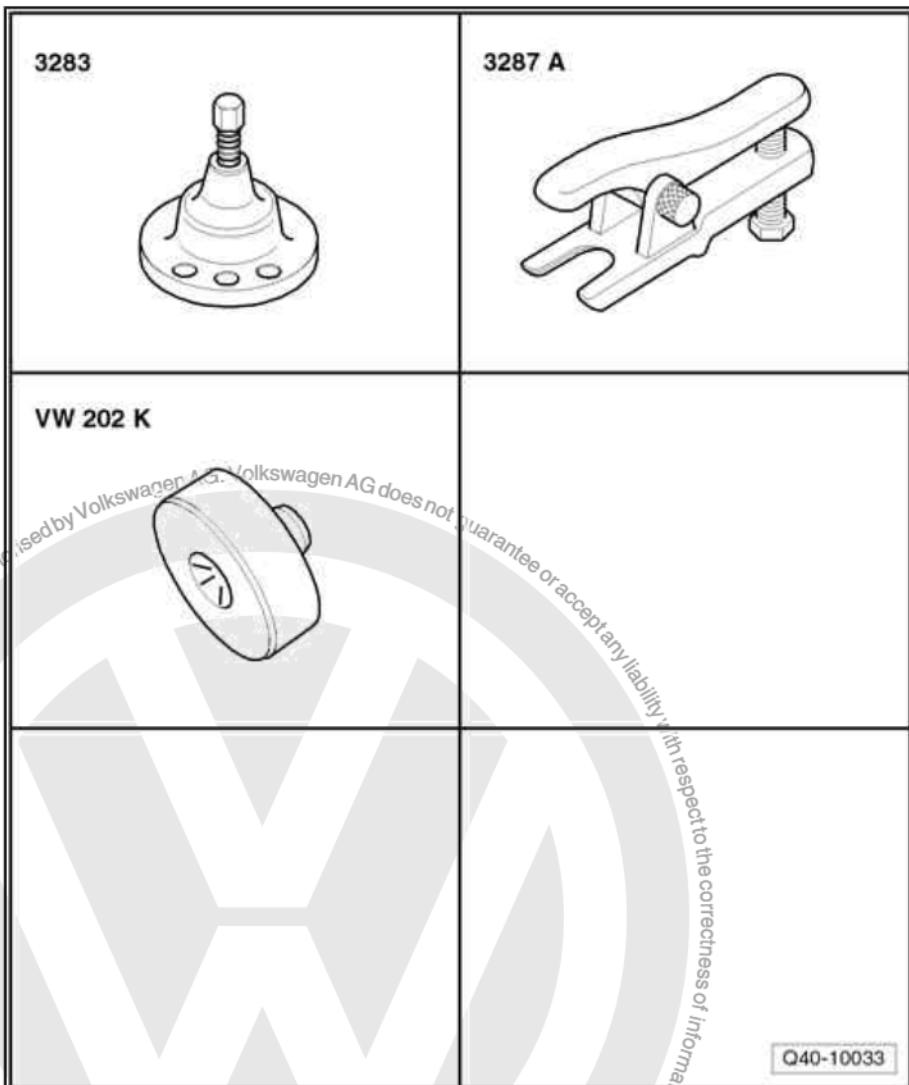
Special tools and workshop equipment required



- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2") - VAG 1332-
- ◆ Similar - EQ 7081 - Gearbox or engine + gearbox set jack - VAG 1383A-
- ◆ Thrust piece - VW 472/1-
- ◆ Press tube - VW 418A-
- ◆ Thrust piece - VW 442-



Special tools and workshop equipment required



Q40-10033

- ◆ Puller - 3283-
- ◆ Puller - 3287A-
- ◆ Extraction base - VW 202K-

### 7.2.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Loosen the fastening nut (dodecahedron) from the drive shaft  
[⇒ page 146](#) .
- Remove the front wheel.



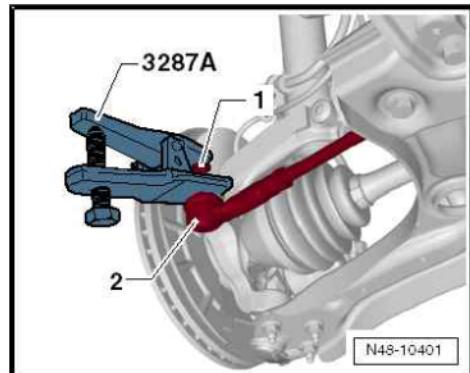
- Loosen the hexagonal nut -1- from the steering terminal.



**WARNING**

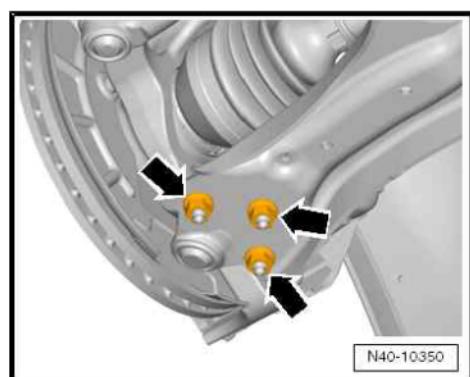
*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .



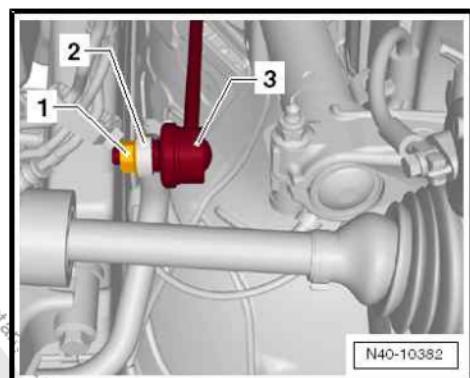
- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:



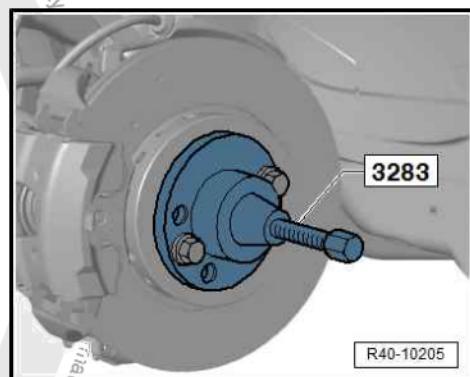
- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



**Note**

*While the drive shaft is being pressed outwards, observe if there is enough space.*

- Remove the wheel roller bearing case with the shaft articulation out of the wishbone.

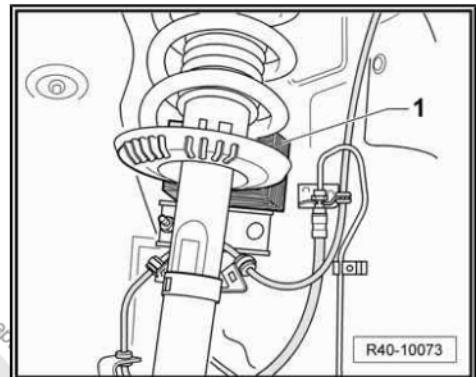




- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*



- Remove the disc brake calliper and tie it to the body with wire ⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the brake disc and protective cover ⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .



*Position the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- underneath (danger of accident from falling parts when extracting the wheel hub and the wheel roller bearing).*

## 7.2.2 Wheel roller bearing hub (04/13►) - remove

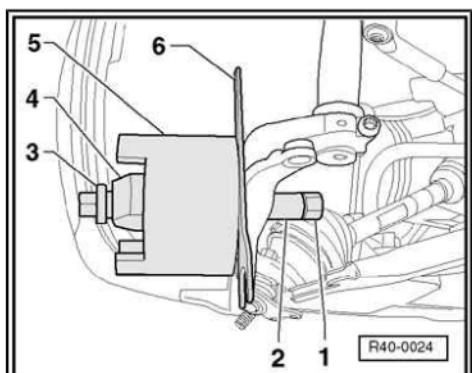


### WARNING

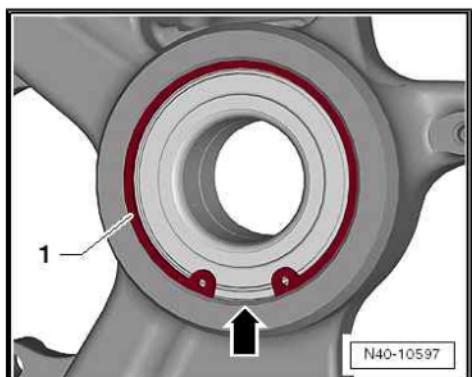
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

Install the removal tool

- 1 - Assembly device - 3253/3-
- 2 - Pressure tube - VW 418A-
- 3 - Assembly device - 3253/6-
- 4 - Assembly device - 3253/2-
- 5 - Assembly device - 3253/1-
- 6 - 50mm Spanner - 3254-



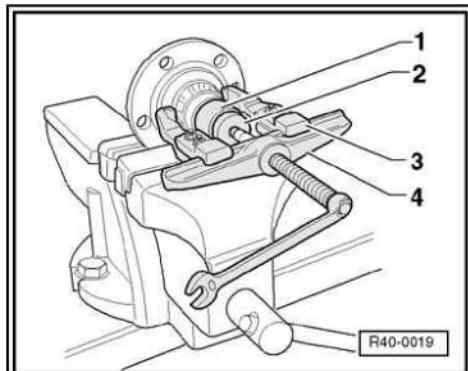
Remove the snap ring -1- with pliers





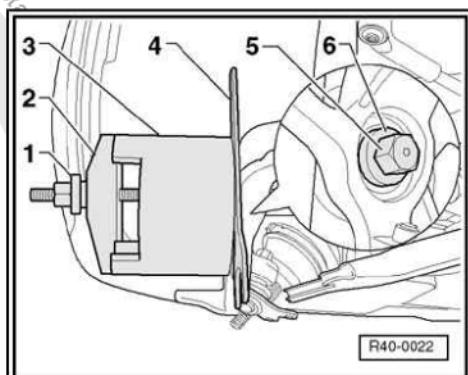
Remove the internal wheel roller bearing track

- 1 - Base - VW 295A-
- 2 - Extraction base - VW 202K-
- 3 - Extractor and Fitter KUKKO 20/10 or KUKKO 20/10 - VW 045Z/1-
- 4 - Extractor and Fitter KUKKO 20/10 or KUKKO 20/10 - VW 045Z-



Remove the wheel roller bearing by removing it from the wheel roller bearing case

- 1 - Assembly device - 3253/5-
- 2 - Assembly device - 3253/2-
- 3 - Assembly device - 3253/1-
- 4 - 50mm Spanner - 3254-
- 5 - Assembly device - 3253/6-
- 6 - Assembly device - 3253/3-



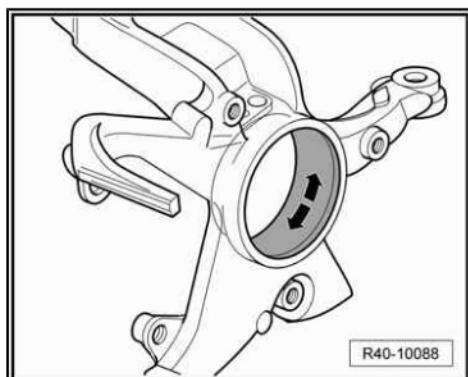
### 7.2.3 Installation



#### WARNING

Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)

- Clean the residues from the wheel roller bearing housing in the wheel roller bearing case.
- Lubricate the wheel roller bearing housing surface with Moly grease - G 052 723 A2-. Refer to the ⇒ Chemicals Manual .





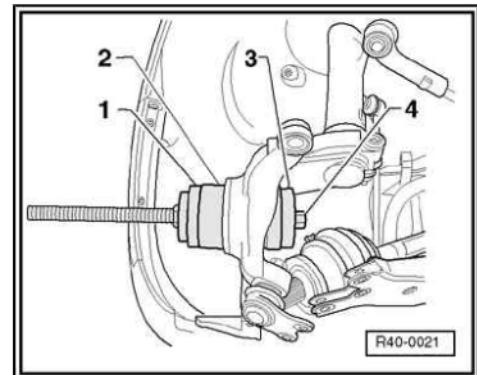
Install the roller bearing in the wheel bearing case

- 1 - Pressure base - VW 442-
- 2 - Wheel roller bearing
- 3 - Installation device - T10064/4-
- 4 - Device - T10030/3-



Note

*Pay attention to the correct alignment of the roller bearing in relation to the roller bearing case*

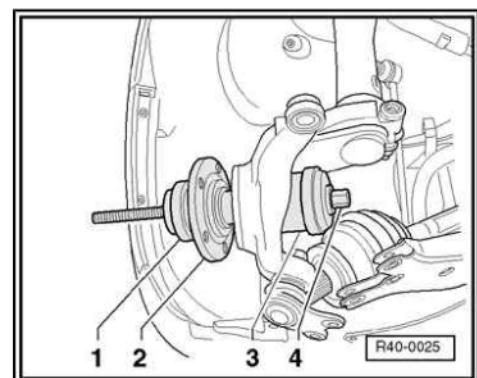


- Install the circlip in the wheel roller bearing case.

Install the wheel hub in the wheel roller bearing

- 1 - Pressure base - VW 442-
- 2 - Wheel hub
- 3 - Pressure base - VW 472/1-
- 4 - Device - T10030/3-

- Clean the surfaces from the thread and the toothed area.



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- Lubricate the toothed area -1- using Molybdenum Paste - G 052 751 A1- . Refer to the ⇒ Chemicals Manual .
- Lubricate the thread on the axle tip -2- and the thread on the fastening nut using Micro oil . Refer to the ⇒ Chemicals Manual .
- Install the drive shaft on the wheel roller bearing case.



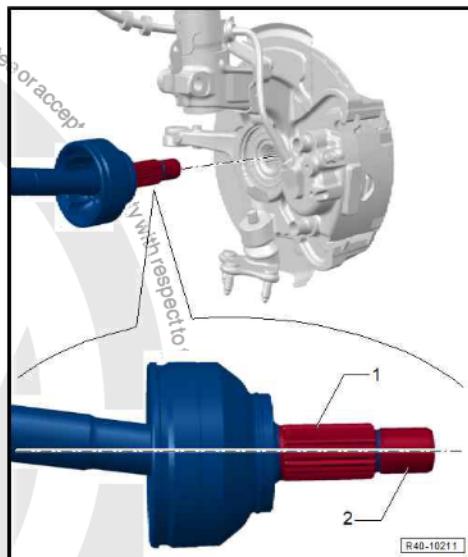
Note

Check if the boots are not damaged or twisted.



**WARNING**

Replace self-locking nuts and bolts subject to angular torque.



- Install the fastening screws (screws on the old markings) for the wishbone swivel guide. Tightening torque, see ⇒ [page 80](#) .
- Install disc protector, brake disc and disc brake calliper ⇒ Brake systems; Rep. gr. 46 ; Front brakes - repair .
- Install the coupling rod. Tightening torque, see ⇒ [page 80](#) .
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see ⇒ [page 80](#) .
- Install the front wheel and tighten the screws. Tightening torque, see ⇒ [page 203](#) .
- Install and tighten the securing nut (dodecahedron). Tightening torque, see ⇒ [page 136](#) .
- Check alignment ⇒ [page 204](#) .

Tightening torques

Components	Tightening torques
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm

**7.3 Front wheel hub with wheel bearing for 13" wheel running gear (FS II 04/13►) - remove and install**

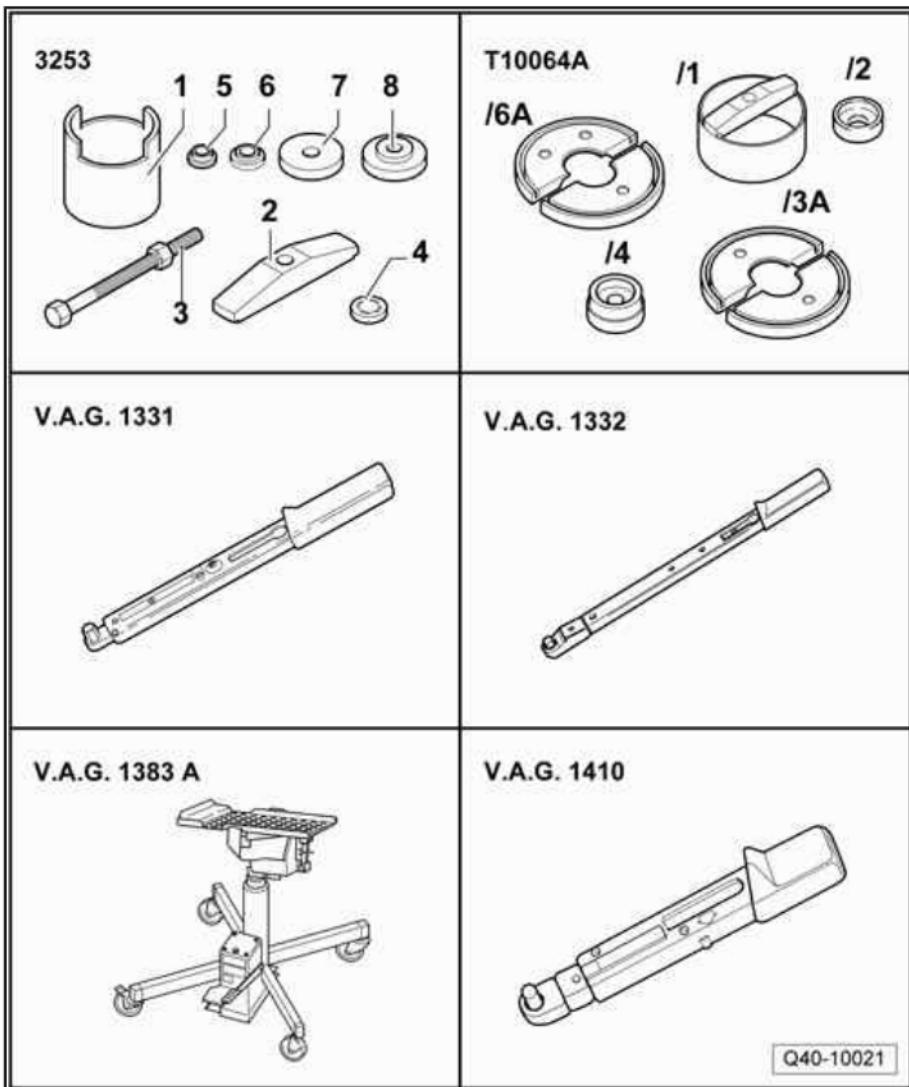


**WARNING**

Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)



Special tools and workshop equipment required

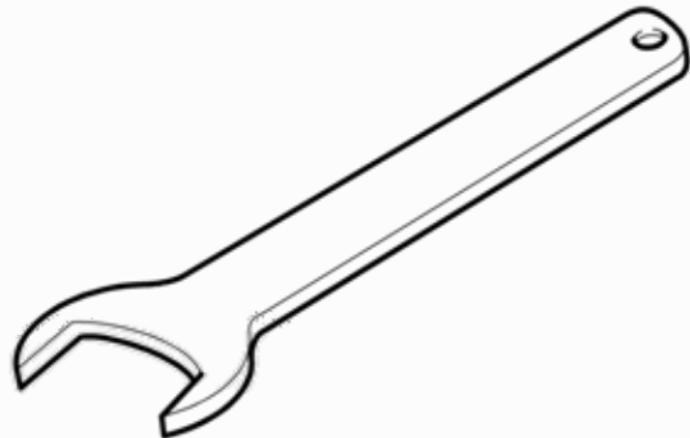


- ◆ Assembly tool - 3253-
- ◆ Installation tool - T10064-
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Torque wrench - 4 to 20 Nm (fit. 3/8") - VAG 1410-

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3254



Q00-10066

◆ 50mm spanner - 3254-

### 7.3.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

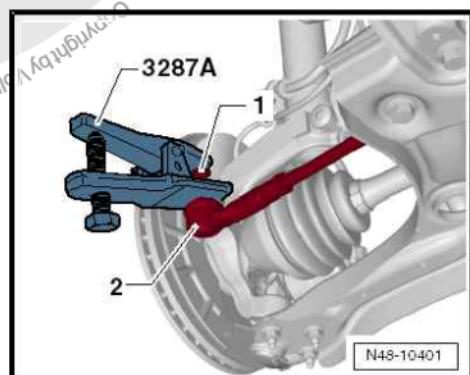
- Loosen the fastening nut (dodecahedron) from the drive shaft [⇒ page 136](#) .
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



#### WARNING

*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .

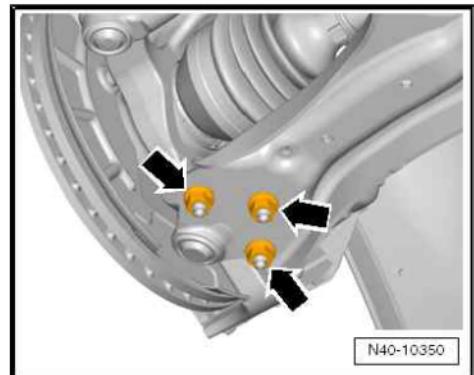


N48-10401



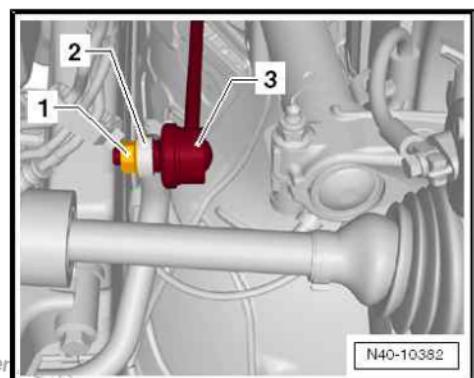
- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:

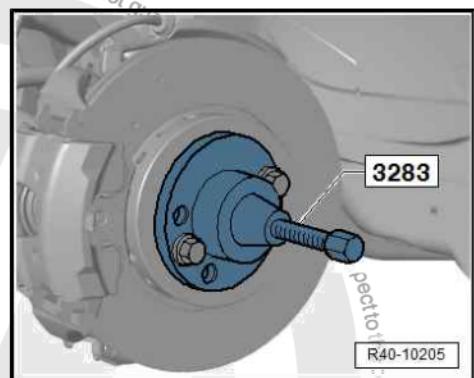


- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



*While the drive shaft is being pressed outwards, observe if there is enough free space.*

- Remove the wheel roller bearing case with the shaft articulation out of the wishbone.

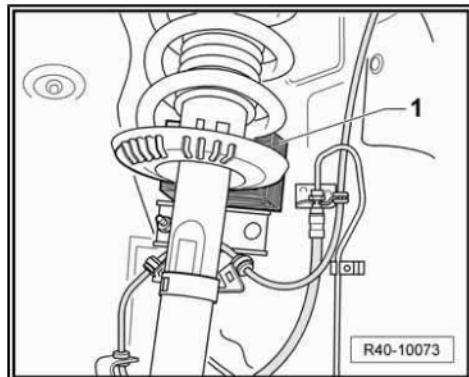




- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*



- Remove the disc brake calliper and tie it to the body with wire ⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the brake disc and protective cover ⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the speed sensor on the front axle ⇒ Brake system; Rep. gr. 45 ; Anti-lock system (ABS) .



*Position the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- underneath (danger of accident from falling parts when extracting the wheel hub and the wheel roller bearing).*

### 7.3.2 Hub with wheel bearing (04/13►) - remove



#### WARNING

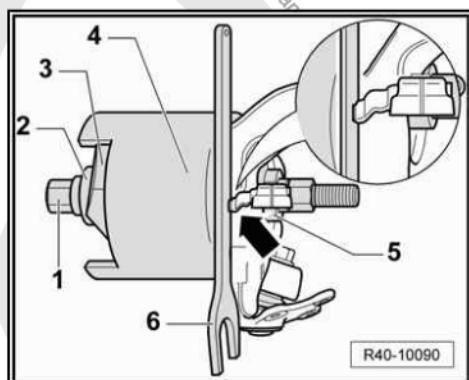
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

- Install the separating device -1- between the wheel roller bearing case and the wheel hub and pre-tension it.

Installation position: The plain sides of the plates face the wheel hub side.

- Hold the device and remove the wheel hub with the wheel bearing.

- 1 - Assembly device - 3253/3-
- 2 - Assembly device - 3253/5-
- 3 - Assembly device - 3253/2-
- 4 - Assembly device - 3253/1-
- 5 - Assembly device - 3253/6-
- 6 - 50mm Spanner - 3254-





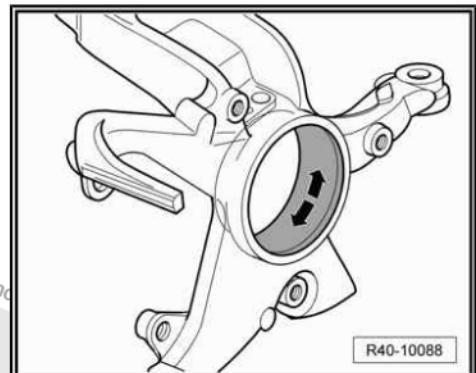
### 7.3.3 Hub with wheel bearing (04/13➤) - install



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

- Remove residues from the drilling retaining washer and the wheel roller bearing case groove.
- Clean the suspension column hole.
- Lubricate the wheel roller bearing housing surface with Molybdenum Grease - G 052 723 A2-. Refer to the ⇒ Chemicals Manual .

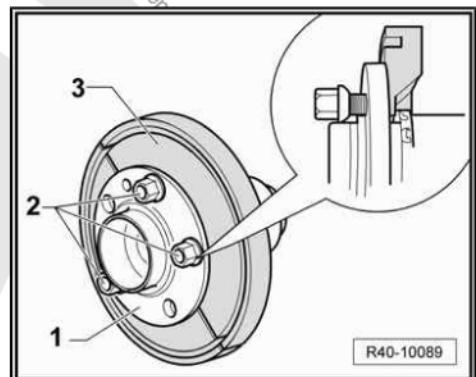


- Install the Claws - T10064/6A- to the wheel hub with wheel bearing.

- 1 - Wheel hub with wheel roller bearing
- 2 - Wheel bolts
- 3 - Installation device - T 10064/6A-



*The wheel bolts 2- must not protrude from the back of the claws of the Installation device - T 10064/6A-*



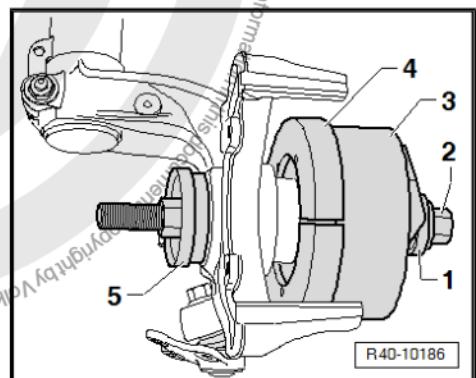
- Install the wheel hub with wheel roller bearing in the wheel roller bearing case.



*When installing, do not tilt the wheel hub with wheel roller bearing*

- Install the wheel hub with wheel roller bearing until the retaining washer fits audibly.

- 1 - Assembly device - 3253/5-
- 2 - Assembly device - 3253/3-
- 3 - Installation device - T10064/1-
- 4 - Installation device - T10064/6A-
- 5 - Installation device - T10064/4-





- Loosen the claws from Installation device - T10064/6A- from wheel hub with wheel roller bearing.

1 - Wheel hub with wheel roller bearing

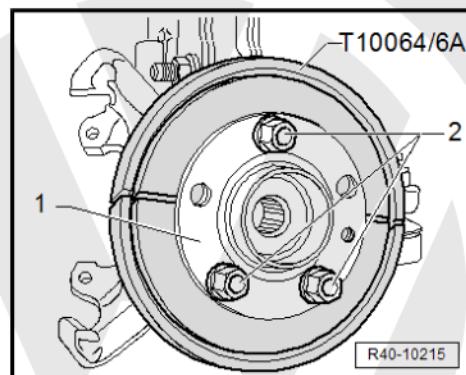
2 - Wheel bolts

- Install the drive shaft in the wheel roller bearing.



Note

*Check if the boots are not damaged or twisted.*



#### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

- Install the fastening screws (screws on the old markings) for the wishbone swivel guide. Tightening torque, see [⇒ page 86](#) .
- Install disc protector, brake disc and disc brake calliper ⇒ Brake systems; Rep. gr. 46 ; Front brakes - repair .
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see [⇒ page 86](#) .
- Install the coupling rod. Tightening torque, see [⇒ page 86](#) .
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#)
- Install and tighten the securing nut (dodecahedron). Tightening torque, see [⇒ page 146](#) .
- Check alignment [⇒ page 204](#) .

#### Tightening torques

Components	Tightening torques
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm

## 7.4 Front wheel hub with wheel bearing for 14" and 15" wheels running gear (FS III 04/13 ➤) - remove and install



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*



Special tools and workshop equipment required

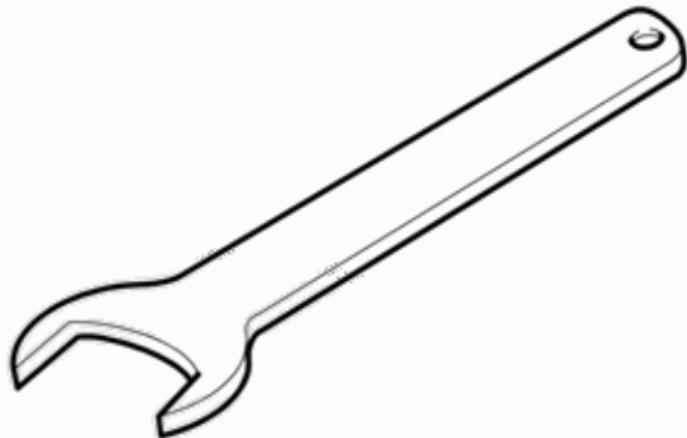
<p>3253</p>	<p>T10064A</p>
<p>V.A.G. 1331</p>	<p>V.A.G. 1332</p>
<p>V.A.G. 1383 A</p>	<p>V.A.G. 1410</p>

Q40-10021

- ◆ Assembly tool - 3253-
- ◆ Installation tool - T 10064-
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Torque wrench - 4 to 20 Nm (fit. 3/8") - VAG 1410-



3254



Q00-10066

♦ 50 mm spanner -3254-

#### 7.4.1 Removal



##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

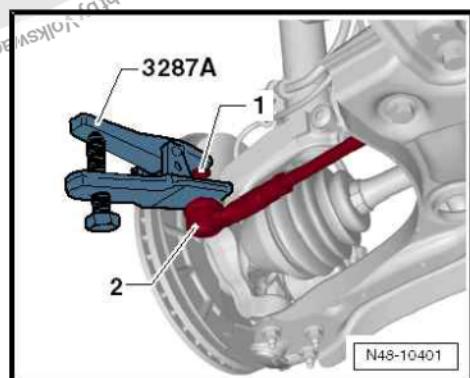
- Loosen the fastening nut (dodecahedron) from the drive shaft [⇒ page 146](#) .
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



##### WARNING

*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .

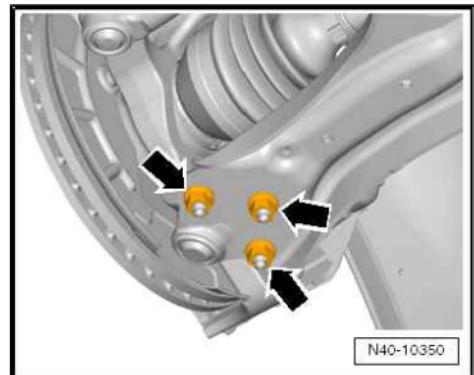


N48-10401



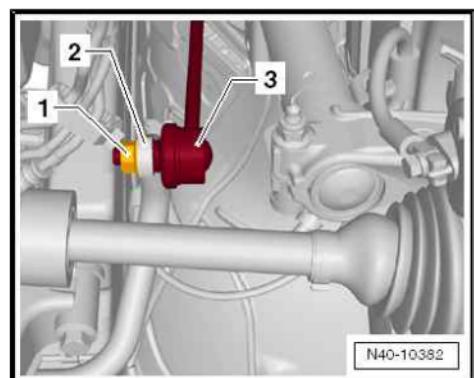
- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:

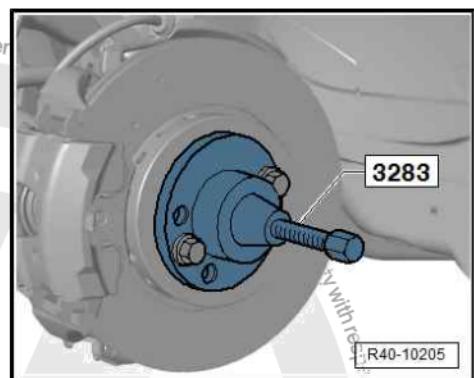


- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



*While the drive shaft is being pressed outwards, observe if there is enough free space.*

- Remove the wheel roller bearing case with the shaft articulation out of the wishbone.

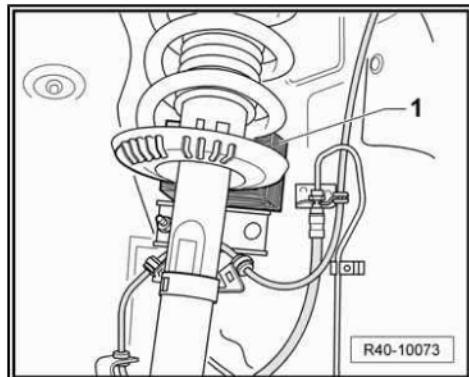




- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*



- Remove the disc brake calliper and tie it to the body with wire ⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the brake disc and protective cover ⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the speed sensor on the front axle ⇒ Brake system; Rep. gr. 45 ; Anti-lock system (ABS) .



*Position the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- underneath (danger of accident from falling parts when extracting the wheel hub and the wheel roller bearing).*

#### 7.4.2 Hub with wheel bearing (04/13►) - remove



##### WARNING

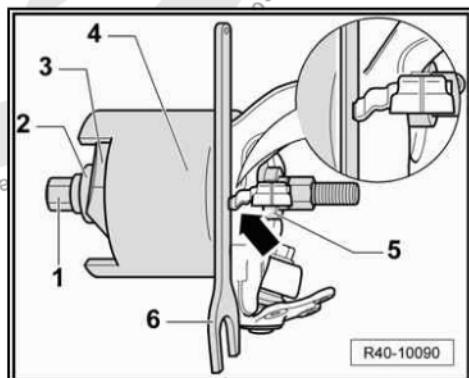
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ page 204*

- Install the separating device -1- between the wheel roller bearing case and the wheel hub, and pre-tension it.

Installation position: The plain sides of the plates face the wheel hub side.

- Hold the device and remove the wheel hub with the wheel bearing.

- 1 - Assembly device - 3253/3-
- 2 - Assembly device - 3253/5-
- 3 - Assembly device - 3253/2-
- 4 - Assembly device - 3253/1-
- 5 - Assembly device - 3253/6-
- 6 - 50 mm Spanner - 3254-





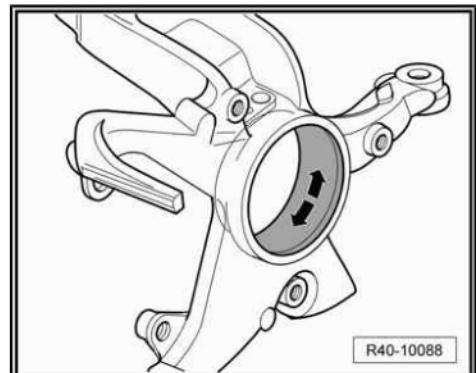
### 7.4.3 Hub with wheel bearing (04/13►) - install



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

- Remove residues from the drilling retaining washer and the wheel roller bearing case groove.
- Clean the suspension column hole.
- Lubricate the wheel roller bearing housing surface with Molybdenum Grease - G 052 723 A2-. See the ⇒ Chemicals Manual .



R40-10088

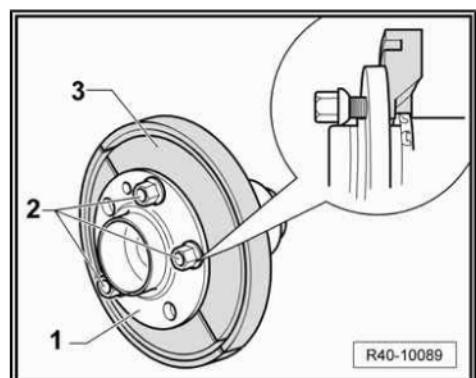
- Install the Claws - T10064/6A- to the wheel hub with wheel bearing.

1 - Wheel hub with wheel roller bearing  
 2 - Wheel bolts  
 3 - Installation device - T10064/6A-



#### Note

*The wheel bolts -2- must not protrude from the back of the claws of the Installation device - T 10064/6A-*



R40-10089

- Install wheel hub with wheel bearing in the wheel bearing case.

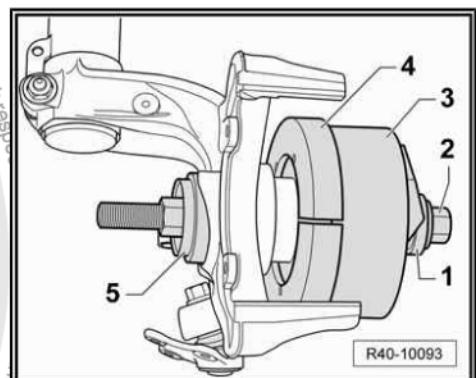


#### Note

*When installing, do not tilt the wheel hub with wheel roller bearing*

- Install the wheel hub with wheel roller bearing until the retaining washer fits audibly.

1 - Assembly device - 3253/5-  
 2 - Assembly device - 3253/3-  
 3 - Installation device - T 10064/1-  
 4 - Installation device - T10064/6A-  
 5 - Installation device - T10064/4-



R40-10093



- Release the Claws - T10064/6A- from the wheel hub with wheel bearing.

1 - Wheel hub with wheel roller bearing

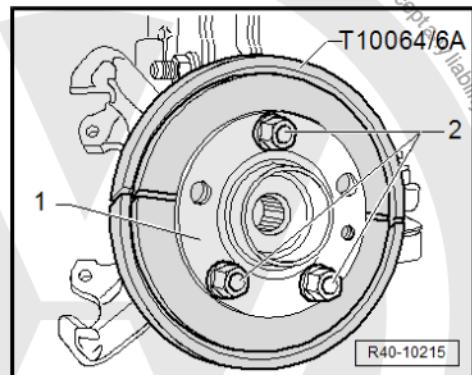
2 - Wheel bolts

- Install the drive shaft on the wheel roller bearing case.



Note

*Check if the boots are not damaged or twisted.*



#### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

- Install the fastening screws (screws on the old markings) for the wishbone swivel guide. Tightening torque, see [⇒ page 92](#) .
- Install disc protector, brake disc and disc brake calliper ⇒ Brake systems; Rep. gr. 46 ; Front brakes - repair .
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see [⇒ page 92](#) .
- Install the coupling rod. Tightening torque, see [⇒ page 92](#) .
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#)
- Install and tighten the securing nut (dodecahedron). Tightening torque, see [⇒ page 146](#) .
- Check alignment [⇒ page 204](#) .

#### Tightening torques

Components	Tightening torques
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm



## 8 III - Front suspension column (►04/13) - repair

### 8.1 Front suspension column (►04/13) - assembly overview



#### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
[⇒ page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Only shock absorbers of the same brand "Supplier" can be mounted in the same vehicle

#### 1 - Shock absorber

See: ⇒ Electronic parts catalogue "ETKA"



In order to remove the shock absorber (right side) for vehicles with total flex engines, it is first necessary to remove the cold start tank ⇒ Engine; Rep. gr. 20; Fuel system - tank, fuel pump



#### WARNING

Only shock absorbers of the same brand "Supplier" can be mounted in the same vehicle.

#### 2 - Rubber support

If applied to this vehicle

#### 3 - Striker

#### 4 - Shock absorber boot

#### 5 - Coil spring

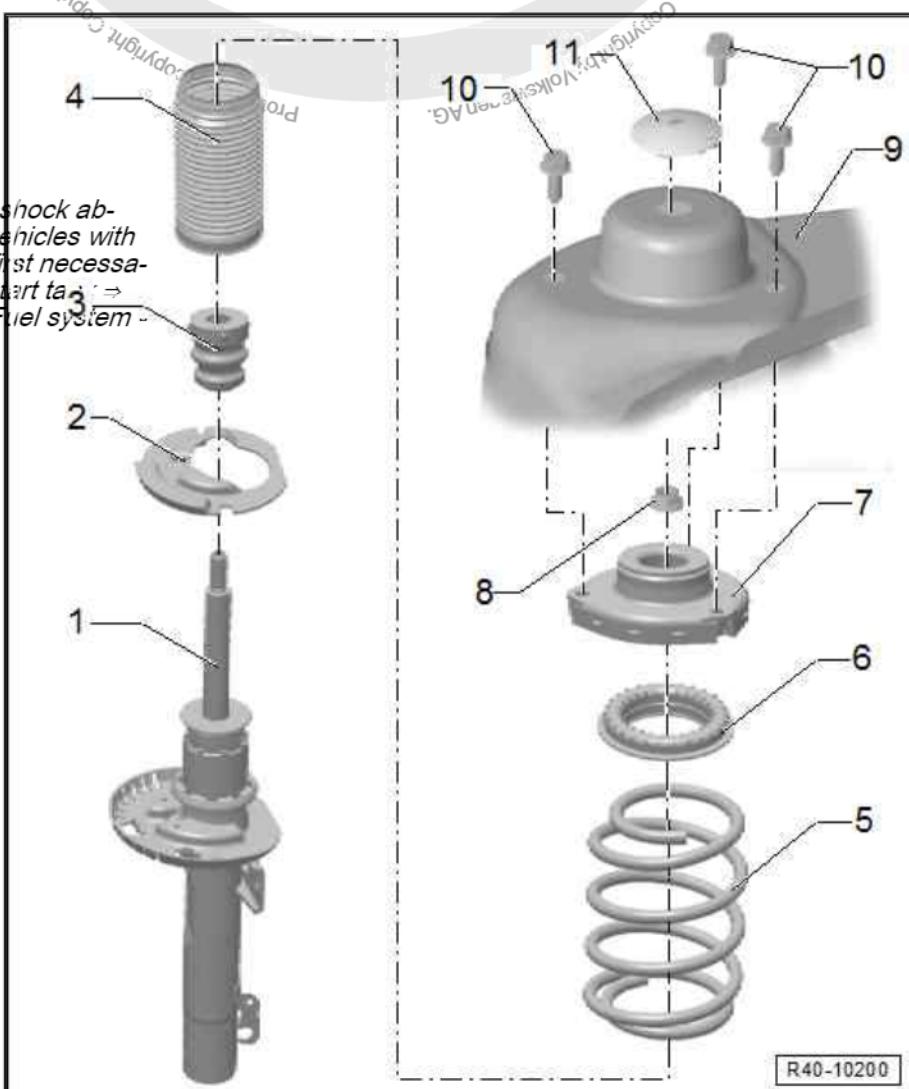
Remove and install  
[⇒ page 122](#)

Observe the colour coding. See: ⇒ Electronic parts catalogue "ETKA"

Spring correspondence through the PR number

These numbers are indicated in the vehicle identification tag

Example ⇒ [page 116](#)



R40-10200



The external spring surface must not be damaged

6 - Axial ball bearing

7 - Suspension column support

8 - Hexagonal nut

Self-locking

60 Nm

Replace once removed

9 - Body

10 - Hexagonal bolt

15 Nm + 90°

Replace once removed

Firstly, the screws on the internal sides of the vehicle must be installed

11 - Cover

## 8.2 Vehicle identification tag

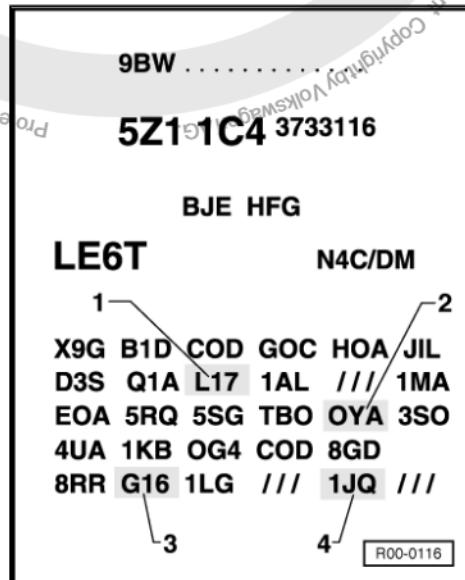
Example

The vehicle ID label is located in the spare wheel arch and in the Maintenance and Warranty book.

The numbers -1 . . . 4- provide information about coil springs and shock absorbers installed in the respective vehicle.

The corresponding spring installed in the vehicle is indicated on the vehicle identification label, documented by the respective PR number of the weight class.

Based on this PR number, one can make the correspondence of the respective spring to the vehicle using the ⇒ Spare Parts Catalogue "ETKA".



## 8.3 Suspension column (►04/13) - remove and install

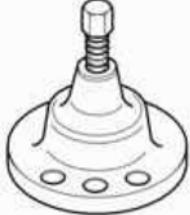
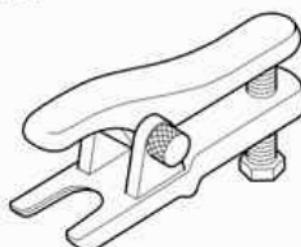


### WARNING

Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)



Special tools and workshop equipment required

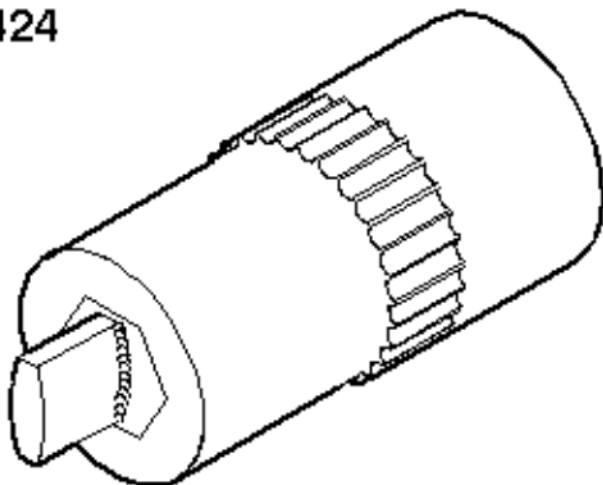
 <p>3283</p>	 <p>T10125</p>
 <p>V.A.G 1331</p>	 <p>V.A.G 1332</p>
 <p>V.A.G 1383 A</p>	 <p>3287 A</p>

Q40-10032

- ◆ Puller - 3287A-
- ◆ 36 mm Grooved Socket - T 10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ 30 mm Grooved Socket (Gedore ref. D32-30)
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Puller - 3287A-



3424



W00-0413

♦ Expansion device - 3424-

### 8.3.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [=> page 204](#)*

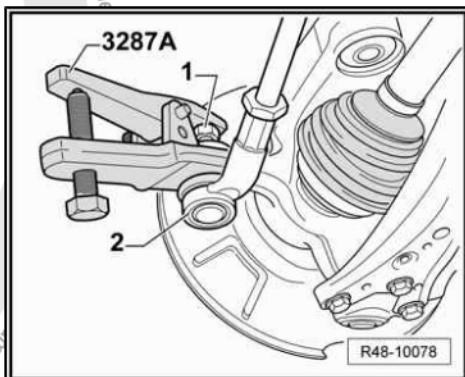
- Loosen the fastening nut (dodecahedron) from the drive shaft [=> page 135](#) .
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



#### WARNING

*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

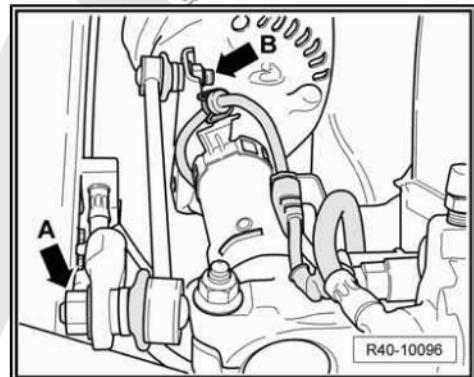
- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .



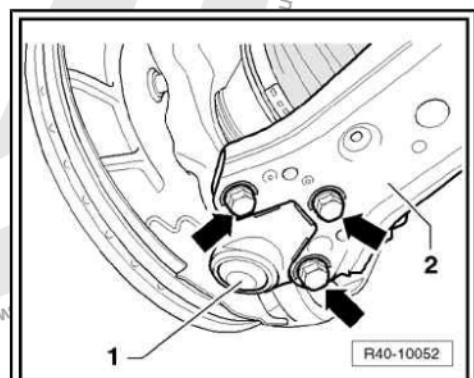
R48-10078



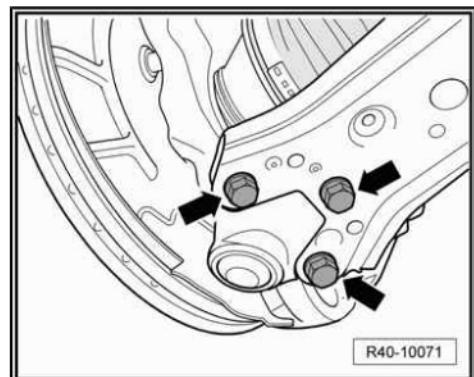
- Loosen the upper hexagonal nut of the coupling rod -arrow B- from suspension strut.
- Unslot and release the speed sensor cable on the suspension strut if the vehicle is equipped with ABS.



- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

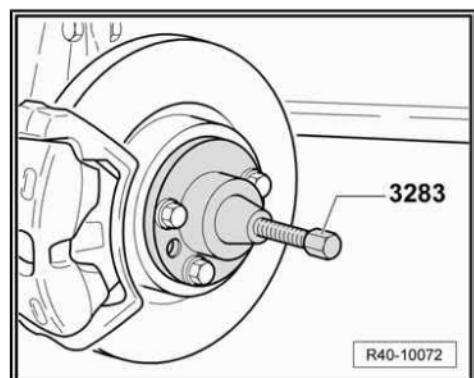


- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



Note

*While the drive shaft is being pressed outwards, observe if there is enough free space.*

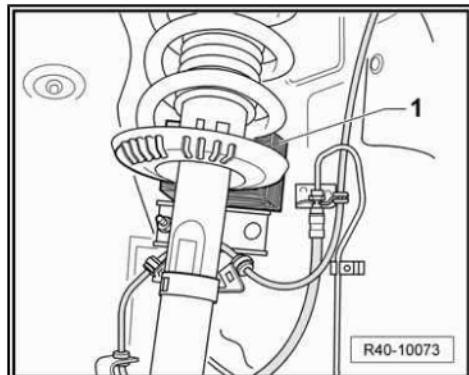




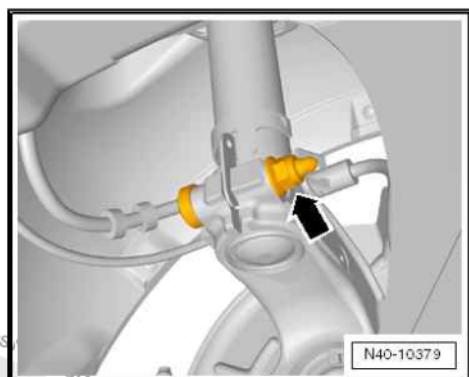
- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.

 Note

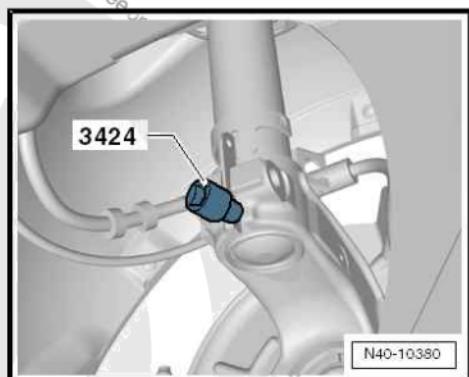
- ◆ *The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*
- ◆ *Place the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for EQ 7081 hydraulic jack - VAG 1359/2- over the wheel bearing box.*



- Loosen the nut -arrow- that connects the wheel roller bearing case to the suspension strut.



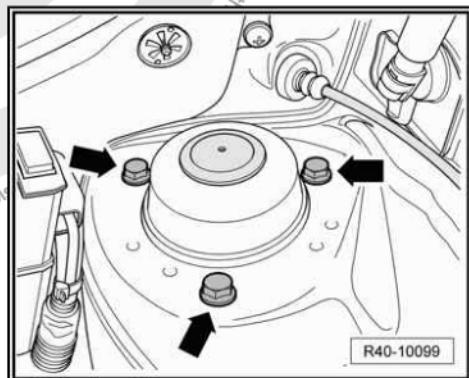
- Install the Expansion device - 3424- in the slot.
- Turn the ratchet 90° and remove it from the Expansion device - 3424- .
- Press the brake disc manually toward the suspension strut.
- Otherwise, the shock absorber tube could incline into the hole in the wheel bearing case.
- Remove the wheel roller bearing case downwards off the shock absorber tube, and lower using Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and ray for EQ 7081 hydraulic jack - VAG 1359/2- until the shock absorber tube is hanging free.
- Fasten the wheel roller bearing case on console/auxiliary frame by using wire.
- Remove the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for EQ 7081 hydraulic jack - VAG 1359/2- over the wheel bearing case.
- Loosen and remove the upper fastening screws -arrows- on the shock absorber.



 Note

*In order to remove the suspension strut (right side) for vehicles with total flex engines, it is first necessary to remove the cold start tank ⇒ Engine; Rep. gr. 20 ; Fuel system - tank, fuel pump*

- Remove the suspension strut.





### 8.3.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

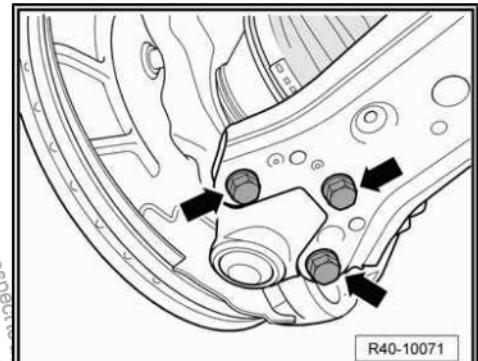
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

*Always replace self-locking nuts and bolts subject to angular torque*

- Install and tighten the upper fastening screws on the shock absorber. Tightening torque, see ⇒ [page 121](#) .
- Install and tighten the fastening screws for the suspension pillar on the wheel roller bearing case. Tightening torque, see ⇒ [page 121](#) .
- To install the drive shaft on the wheel roller bearing case, refer to:
  - ◆ For vehicles without ABS ⇒ [page 142](#)
  - ◆ For vehicles with ABS (FS II brake calipers - 13" wheel running gear) ⇒ [page 142](#)
  - ◆ For vehicles with ABS (FS III brake calipers - 14" and 15" wheels running gear) ⇒ [page 143](#)
- Insert the swivel joint in the wishbone
- Install the fastening screws -arrows- (screws on the old markings) for the wishbone swivel guide. Tightening torque, see ⇒ [page 121](#) .
- Install the front wheel and tighten the screws. Tightening torque, see ⇒ [page 203](#) .
- Install and tighten the securing nut (dodecahedron). Tightening torque, see ⇒ [page 135](#) .
- Check alignment ⇒ [page 204](#) .

#### Tightening torques

Components	Tightening torque
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Swivel joint to wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Body suspension pillar ◆ Use new fastening screws	15 Nm + 90°
Wheel roller bearing case suspension pillar ◆ Use new fastening nuts	60 Nm + 90°



R40-10071



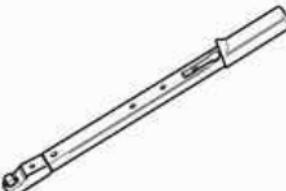
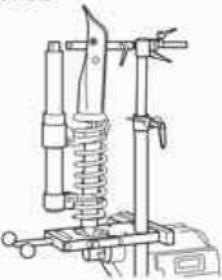
## 8.4 Front suspension spring (►04/13) - repair



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

Special tools and workshop equipment required

<b>V.A.G. 1332</b> 	<b>V.A.G. 1752</b> 
<b>T10001</b> 	

Q40-10027

- ◆ Torque wrench - 40 to 200 Nm (1/2" drive) - VAG 1332-
- ◆ Compressor device or VW 5340 -VAG 1752/1- and Spring holder - VAG 1752/4-
- ◆ Wrench set - T 10001-

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### 8.4.1 Coil spring (►04/13) - removal

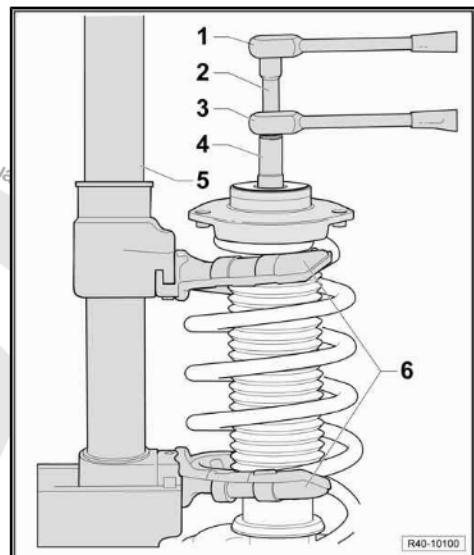


#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ➤ [page 204](#)*

- Remove the suspension column ➤ [page 116](#) .
- Compress the coil spring by using the Compressor device or VW 5340 - VAG 1752/1- until the axial ball bearing on the upper section is free.
- Remove the hex nut from the shock absorber rod.
- Remove the suspension strut parts and spring individually with the Compressor device or VW 5340 - VAG 1752/1- .

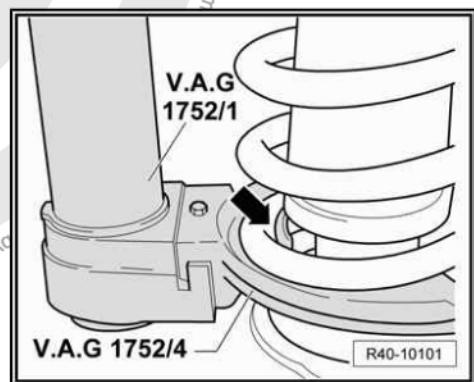
1 - "Torque wrench - 40 to 200 Nm (fit 1/2")" - VAG 1332-  
 2 - Wrench set -T10001/8-  
 3 - Wrench set - T10001/11-  
 4 - Wrench set -T10001/5-  
 5 - Supercharger device or VW 5340 - VAG 1752/1-  
 6 - Spring seat - VAG 1752/4-



#### WARNING

*Initially, tension the spring until the upper spring plate pressure is relieved.*

- Make sure the coil spring is correctly fitted on the Spring holder - VAG 1752/4- -arrow-.



### 8.4.2 Coil spring (►04/13) - installation



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ➤ [page 204](#)*

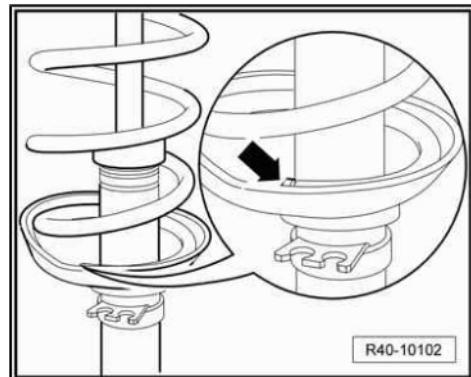
- Fit the coil spring to the lower spring holder with the Compression device or VW 5340 - VAG 1752/1- .



- The end of the coil spring must touch the stop -arrow-.
- Install and tighten the securing nut of the shock absorber rod. Tightening torque, see [page 124](#).
- Release the Compression device or VW 5340 - VAG 1752/1- and remove it from the coil spring.
- Install the suspension strut [page 116](#).

Tightening torques

Component	Tightening torque
Shock absorber rod to suspension strut mounting ◆ Use new fastening nuts	60 Nm





## 9 III - Front suspension column (04/13►) - repair

### 9.1 Front suspension column (04/13►) - assembly overview



#### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
[⇒ page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Only shock absorbers of the same brand "Supplier" can be mounted in the same vehicle

#### 1 - Shock absorber

See: ⇒ Electronic parts catalogue "ETKA"



In order to remove the shock absorber (right side) for vehicles with total flex engines, it is first necessary to remove the cold start tank ⇒ Engine; Rep. gr. 20 ; Fuel system - tank, fuel pump



#### WARNING

Only shock absorbers of the same brand "Supplier" can be mounted in the same vehicle.

#### 2 - Rubber support

If applied to this vehicle

#### 3 - Striker

#### 4 - Shock absorber boot

#### 5 - Coil spring

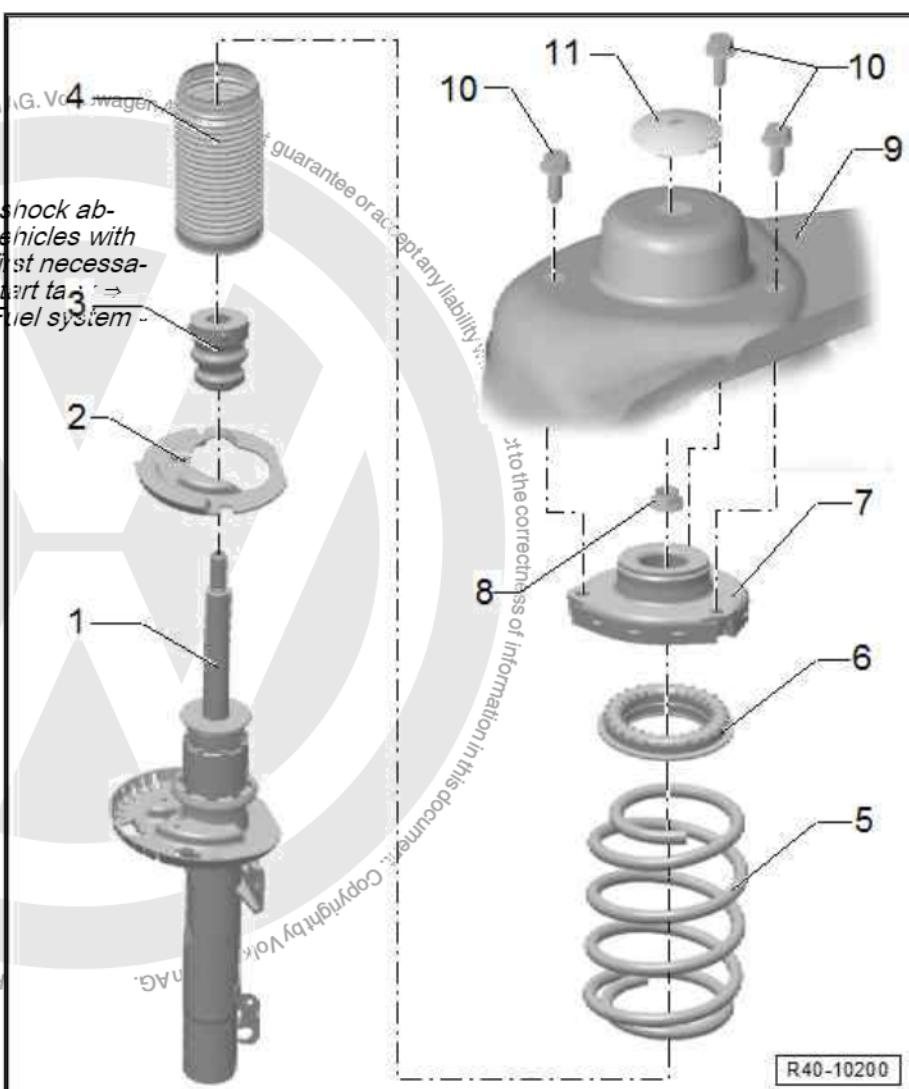
Remove and install  
[⇒ page 122](#)

Observe the colour coding. See: ⇒ Electronic parts catalogue "ETKA"

Spring correspondence through the PR number

These numbers are indicated in the vehicle identification tag

Example ⇒ [page 116](#)



R40-10200



- The external spring surface must not be damaged

6 - Axial ball bearing

7 - Suspension column support

8 - Hexagonal nut

- Self-locking
- 60 Nm
- Replace once removed

9 - Body

10 - Hexagonal bolt

- 15 Nm + 90°
- Replace once removed
- Firstly, the screws on the internal sides of the vehicle must be installed

11 - Cover

## 9.2 Vehicle identification tag

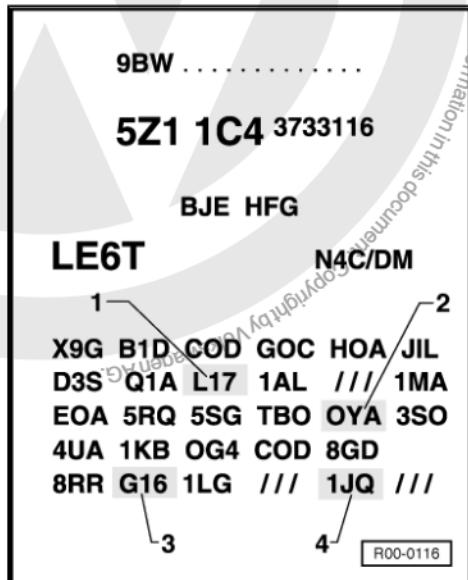
Example

The vehicle ID label is located in the spare wheel arch and in the Maintenance and Warranty book.

The numbers -1 . . . 4- provide information about coil springs and shock absorbers installed in the respective vehicle.

The corresponding spring installed in the vehicle is indicated on the vehicle identification label, documented by the respective PR number of the weight class.

Based on this PR number, one can make the correspondence of the respective spring to the vehicle using the ⇒ Spare Parts Catalogue "ETKA" .



## 9.3 Suspension column (04/13►) - remove and install

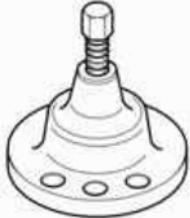
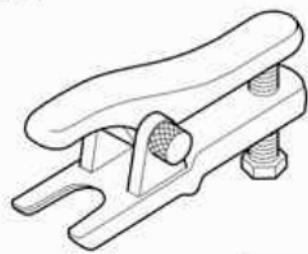


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ page 204*

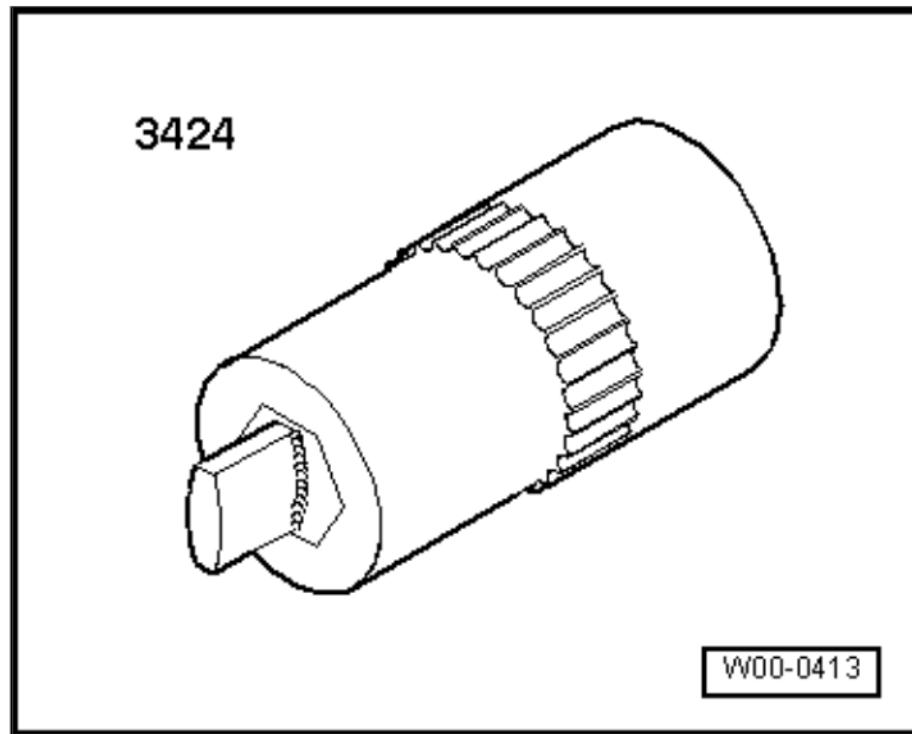


Special tools and workshop equipment required

 <p><b>3283</b></p>	 <p><b>T10125</b></p>
 <p><b>V.A.G 1331</b></p>	 <p><b>V.A.G 1332</b></p>
 <p><b>V.A.G 1383 A</b></p>	 <p><b>3287 A</b></p>

Q40-10032

- ◆ Puller - 3287A-
- ◆ 36mm Grooved Socket - T 10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ 30mm Grooved Socket (Gedore ref. D32-30)
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Puller - 3287A-



♦ Expansion device - 3424-

### 9.3.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "Miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

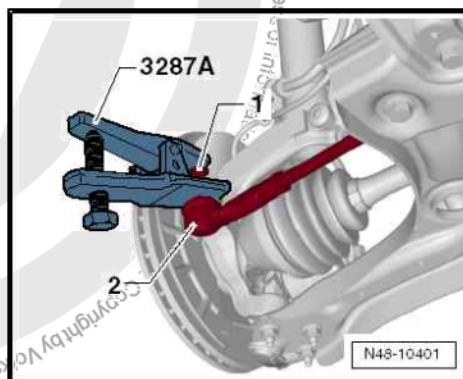
- Loosen the fastening nut (dodecahedron) from the drive shaft [⇒ page 135](#) .
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



#### WARNING

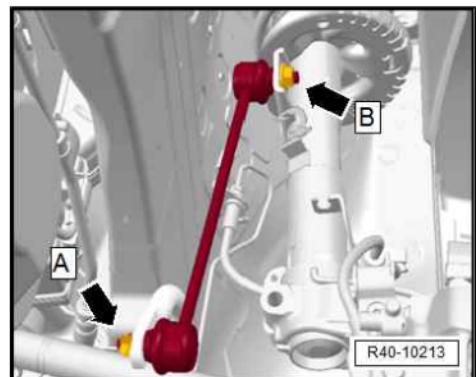
*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .



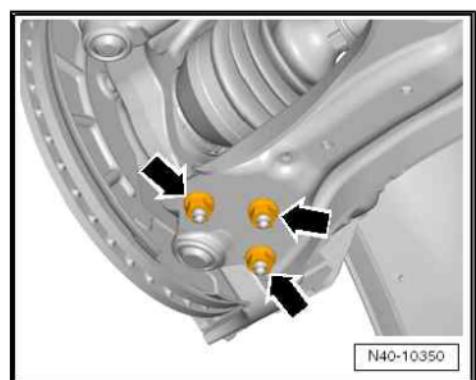


- Loosen the upper hexagonal nut of the coupling rod -arrow B- from suspension strut.
- Unslot and release the speed sensor cable on the suspension strut if the vehicle is equipped with ABS.



R40-10213

- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.



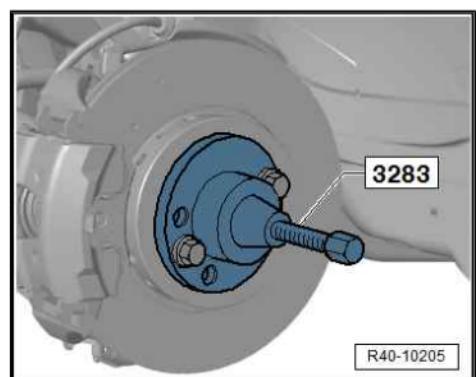
N40-10350

- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



**Note**

*While the drive shaft is being pressed outwards, observe if there is enough free space.*



R40-10205

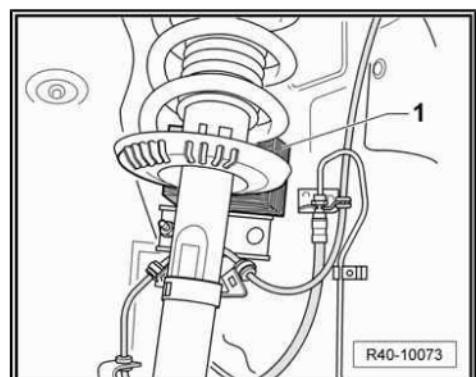
- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



**Note**

◆ *The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*

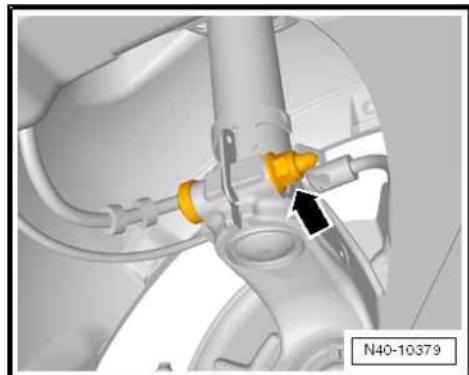
- Place the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A, and Tray for EQ 7081 hydraulic jack - VAG 1359/2- over the wheel bearing box.



R40-10073



- Loosen the nut -arrow- that connects the wheel roller bearing case to the suspension strut.



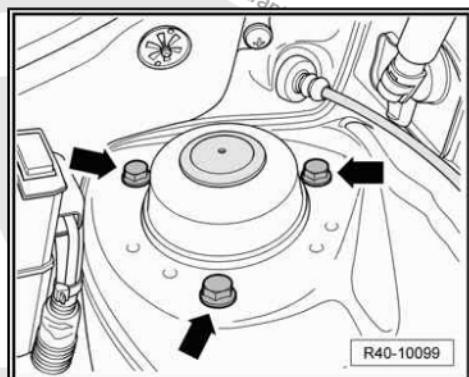
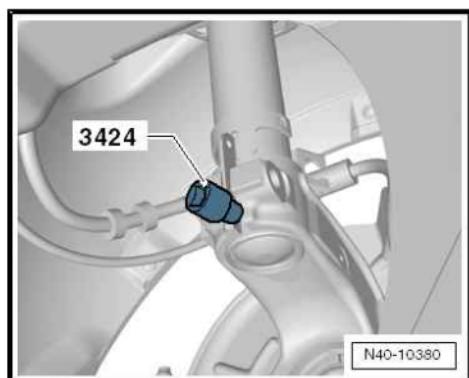
- Install the Expansion device - 3424- in the slot.
- Turn the ratchet 90° and remove it from the Expansion device - 3424- .
- Press the brake disc manually toward the suspension strut.
- Otherwise, the shock absorber tube could incline into the hole in the wheel bearing case.
- Remove the wheel roller bearing case downwards off the shock absorber tube, and lower using Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and ray for EQ 7081 hydraulic jack - VAG 1359/2- until the shock absorber tube is hanging free.
- Fasten the wheel roller bearing case on console/auxiliary frame by using wire.
- Remove the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for EQ 7081 hydraulic jack - VAG 1359/2- over the wheel bearing case.
- Loosen and remove the upper fastening screws -arrows- on the shock absorber.



Note

*In order to remove the suspension strut (right side) for vehicles with total flex engines, it is first necessary to remove the cold start tank ⇒ Engine; Rep. gr. 20 ; Fuel system - tank, fuel pump*

- Remove the suspension strut.



### 9.3.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



**WARNING**

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ page 204*

*Always replace self-locking nuts and bolts subject to angular torque*

- Install and tighten the upper fastening screws on the shock absorber. Tightening torque, see ⇒ [page 121](#) .



- Install and tighten the fastening screws for the suspension pillar on the wheel roller bearing case. Tightening torque, see [⇒ page 121](#).
- To install the drive shaft on the wheel roller bearing case, refer to:
  - ◆ For vehicles without ABS [⇒ page 142](#)
  - ◆ For vehicles with ABS (FS II brake calipers - 13" wheel running gear) [⇒ page 142](#)
  - ◆ For vehicles with ABS (FS III brake calipers - 14" and 15" wheels running gear) [⇒ page 143](#)
- Insert the swivel joint in the wishbone.
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#).
- Install and tighten the securing nut (dodecahedron). Tightening torque, see [⇒ page 135](#).
- Check alignment [⇒ page 204](#).

#### Tightening torques

Components	Tightening torque
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Swivel joint to wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Body suspension pillar ◆ Use new fastening screws	15 Nm + 90°
Wheel roller bearing case suspension pillar ◆ Use new fastening nuts	60 Nm + 90°

#### 9.4 Front suspension spring (04/13►) - repair

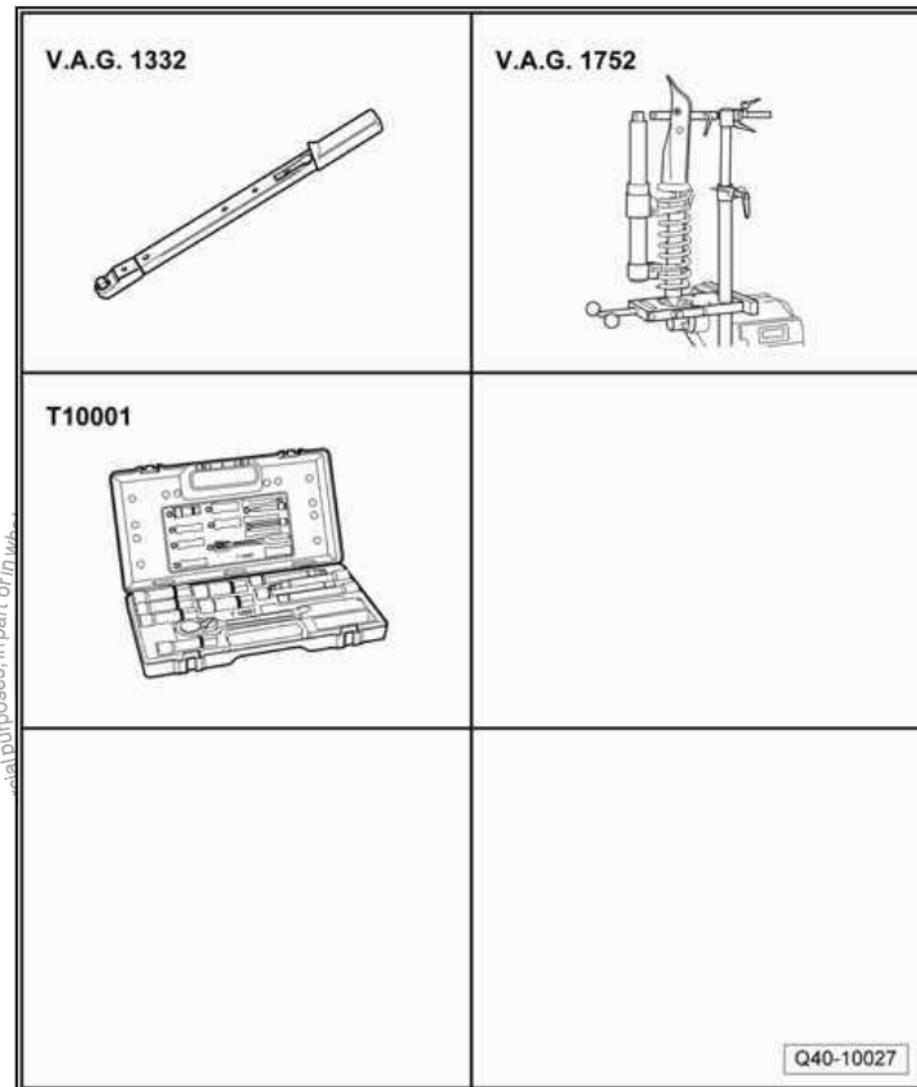


##### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*



Special tools and workshop equipment required



- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Compressor device or VW 5340 - VAG 1752/1- and Spring holder - VAG 1752/4-
- ◆ Wrench set - T 10001-

#### 9.4.1 Coil spring (04/13►) - removal

- Remove the suspension column [⇒ page 116](#) .



- Compress the coil spring by using the Compressor device or VW 5340 - VAG 1752/1- until the axial ball bearing on the upper section is free.

- Remove the hex nut from the shock absorber rod.

- Remove the suspension strut parts and spring individually with the Compressor device or VW 5340 - VAG 1752/1- .

1 - "Torque wrench - 40 to 200 Nm (fit 1/2")" - VAG 1332-

2 - Wrench set -T10001/8-

3 - Wrench set - T10001/11-

4 - Wrench set - T10001/5-

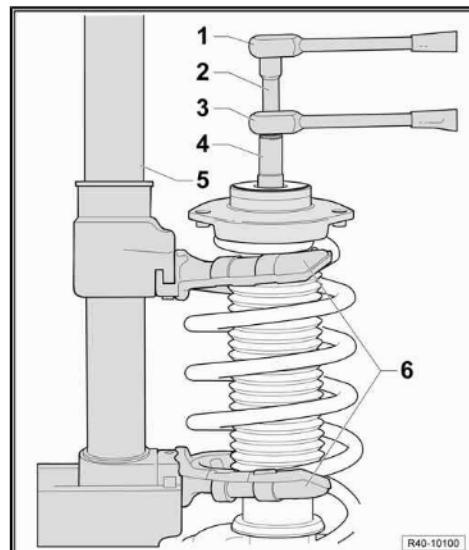
5 - Supercharger device or VW 5340 - VAG 1752/1-

6 - Spring seat - VAG 1752/4-



#### WARNING

*Initially, tension the spring until the upper spring plate pressure is relieved.*

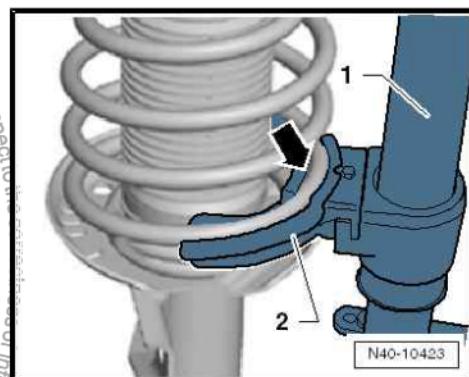


R40-10100

Make sure the coil spring is correctly fitted on the Spring holder  
 - VAG 1752/4- -arrow-.

1 - V.A.G. 1752/1

2 - V.A.G. 1752/4



N40-10423

#### 9.4.2 Coil spring (04/13➤) - installation



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ➔ page 204*

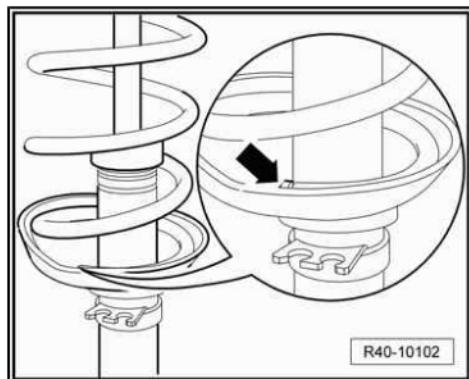
- Fit the coil spring to the lower spring holder with the Compressor device or VW 5340 - VAG 1752/1- .



- The end of the coil spring must touch the stop -arrow-.
- Install and tighten the securing nut of the shock absorber rod. Tightening torque, see [page 124](#).
- Release the Compression device or VW 5340 - VAG 1752/1- and remove it from the coil spring.
- Install the suspension strut [page 116](#).

Tightening torques

Component	Tightening torque
Shock absorber rod to suspension strut mounting ◆ Use new fastening nuts	60 Nm

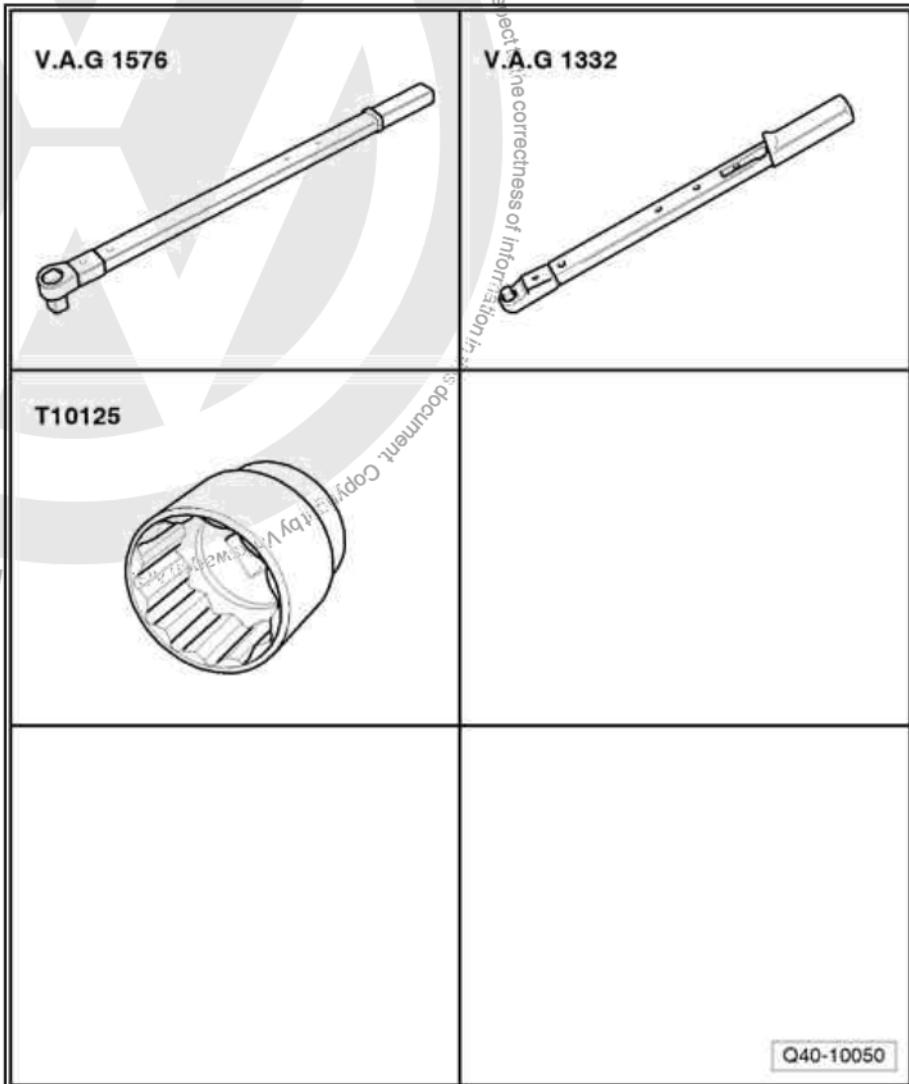




## 10 Constant velocity drive shaft (►04/13) - remove and install

### 10.1 Fastening nut (dodecahedron) of the drive shaft (►04/13) - loosen and tighten

Special tools and workshop equipment required



- ◆ "Torque wrench - 75 to 400 Nm (fit. 3/4" drive) - VAG 1576-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ 36 mm Grooved Socket - T10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ 30 mm Grooved Socket (Gedore ref. D32-30)



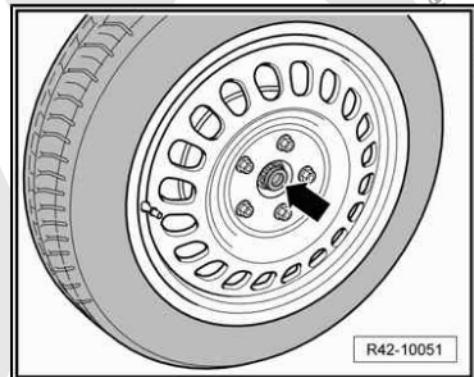
### 10.1.1 Loosen the fastening nut (dodecahedron) (►04/13)

- With the vehicle still sitting on its wheels, loosen the fastening nut (dodecahedron) -arrow- by, at the most,  $90^\circ$  (1/4 turn), so as not to damage the wheel bearing.



#### WARNING

*Loosen the dodecahedron nut only by "90° at the most", or (1/4 turn), so as not to damage the wheel hub and bearing*



- For vehicles with ABS breaks, use the 36mm grooved socket - T10125- or 36mm grooved socket (Gedore ref. D32-36)
- For vehicles without ABS breaks, use the 30mm grooved socket (Gedore ref. D32-30)
- Elevate the vehicle until the front axle is unloaded (wheels suspended) ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, vehicle elevation .

And follow the following instructions:

- Activate the brake pedal and at the same time hold the steering wheel so that the wheels are straight ahead, with help from a second person
- Loosen and completely remove the fastening nut (dodecahedron).



#### WARNING

- When the fastening nuts (dodecahedron) of the drive shafts are loosened from the external sides of their wheels, the wheel hub and bearing set must not be overloaded. However, the vehicle must have its wheels suspended to avoid damage to the wheel hub and bearing (thus reducing the useful life of the set)*
- Vehicles without their semi-drive shafts with constant velocity joints must not be moved*

### 10.1.2 Tighten the fastening nut (dodecahedron) (►04/13)

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

- Always replace self-locking nuts and bolts subject to angular torque*
- Remove any residues of paint and/or corrosion on thread/splines from the external constant-velocity joint*
- The vehicle must have its wheels suspended to avoid damage to the wheel hub and bearing (thus reducing the useful life of the set)*
- Vehicles without their semi-drive shafts with constant velocity joints must not be moved*



Use new fastening nuts!

- Install the fastening nut (dodecahedron) in the drive shaft.

 Note

*The vehicle must have its wheels suspended to avoid damage to the wheel hub and bearing*

With the vehicle raised, one must:

- Activate the brake pedal and at the same time hold the steering wheel so that the wheels are straight ahead, with help from a second person.
- Tighten the fastening nut (dodecahedron). Tightening torque, see [⇒ page 137](#).

Tightening torques

Components	Tightening torque
Dodecahedron nut for vehicles (without ABS) ◆ Use new fastening nuts	◆ Pre-tighten with 200 + 50 Nm of torque and loosen 180°(1/2 turn) ◆ Tighten with a final torque of 50 Nm + 50°
Dodecahedron nut for vehicles with ABS (FS II brake caliper - 13" wheel running gear) <a href="#">⇒ page 137</a> ◆ Use new fastening nuts ◆ Fastening nut (black) ◆ Firstly, apply Liquid Sealant - D 185 400 A3- onto the already properly cleaned groove and external thread of the drive shaft. Refer to the <a href="#">Chemicals Manual</a>	50 Nm
Dodecahedron nut for vehicles with ABS (FS III brake caliper - 14" and 15" wheels running gear) ◆ Use new fastening nuts ◆ Fastening nut (silver)	50 Nm + 45°



**WARNING**

*For vehicles (13" wheels running gear with ABS), the torque must be applied within at most 2 minutes after inserting the drive shaft into the wheel hub. After finishing torquening, the vehicle must remain at least 1.5 hour without effort onto the drive shaft (only parking manoeuvres allowed)*



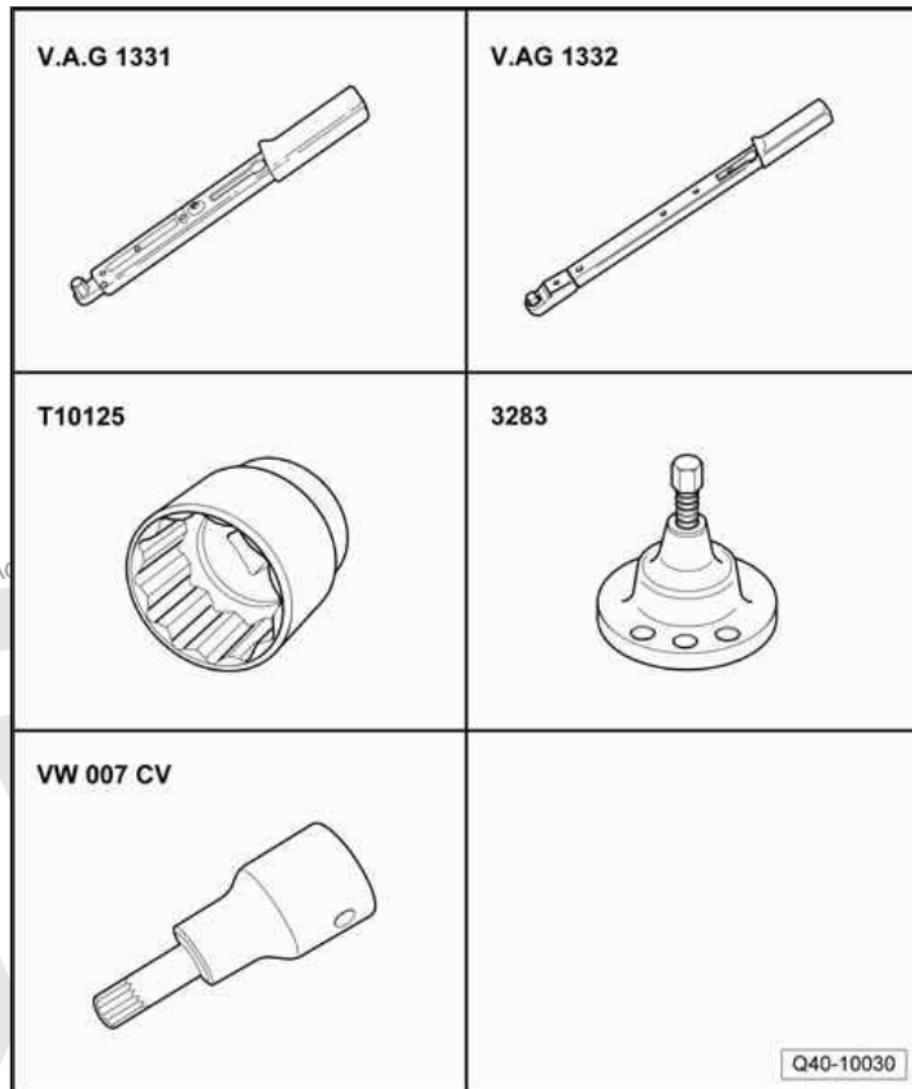
## 10.2 Constant velocity drive shaft (►04/13) - remove and install



### WARNING

- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ The only operation authorized by VW engineering is the replacement of the complete drive shafts (external or internal) and the respective boots

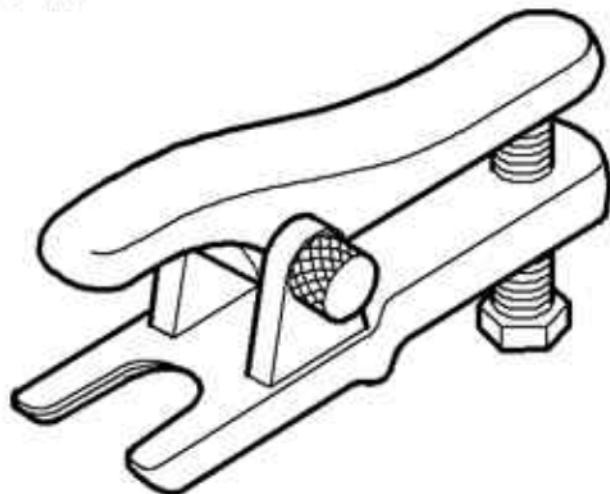
Special tools and workshop equipment required



- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ 36 mm Grooved Socket - T10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ Puller - 3283-
- ◆ Multi-teeth socket M8 (enc.1/2") - VW 007CV-



3287 A



Q00-10089

◆ Puller - 3287 A

### 10.2.1 Removal

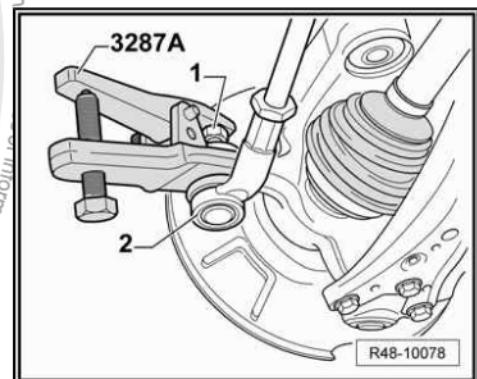
- Loosen the fastening nut (dodecahedron) from the drive shaft  
⇒ [page 135](#).
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Slightly release the fastening screws of the articulated axle from the gearbox drive flange.
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



#### WARNING

*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

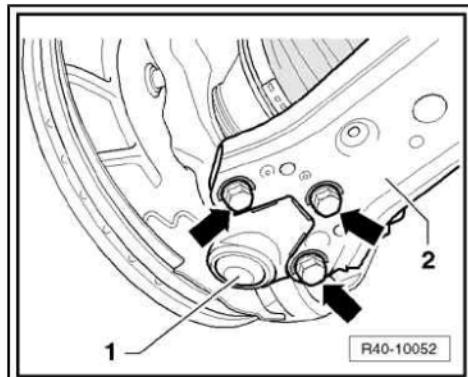
- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .



R48-10078

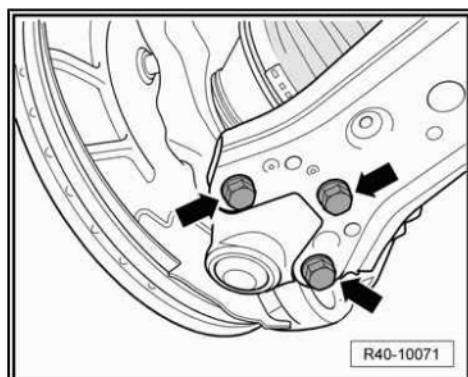


- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



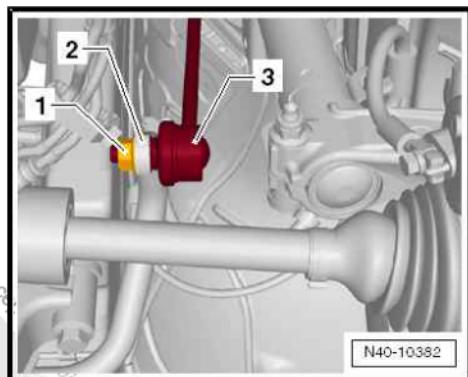
- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:



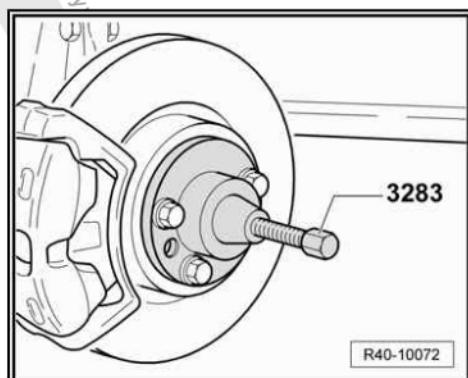
- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



Note

*While the drive shaft is being pressed outwards, observe if there is enough free space.*

- Remove the wheel roller bearing case with the shaft articulation out of the wishbone.

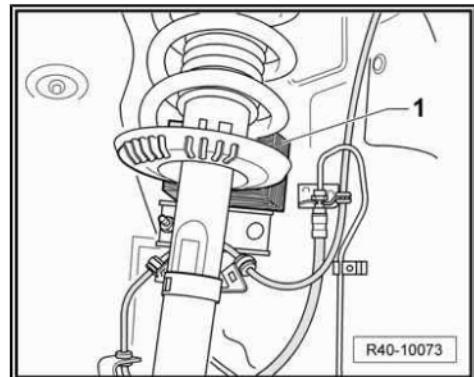




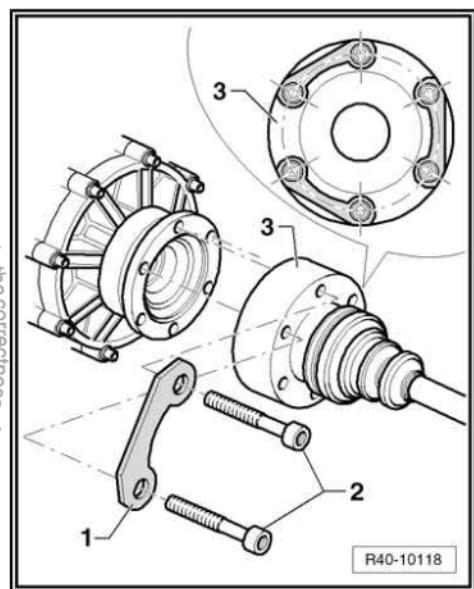
- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*



- Loosen and remove the fastening screws -2- and the seating plates -1-, using the Multi-tooth socket M8 (enc. 1/2") - VW 007CV- .
- Remove the drive shaft -3-.



## 10.2.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



### WARNING

- ◆ Always replace self-locking nuts and bolts subject to an angular torque
- ◆ Check if the boots for the drive shaft are not damaged or twisted
- ◆ Remove any residues of paint and/or corrosion on thread/splines from the external constant-velocity joint



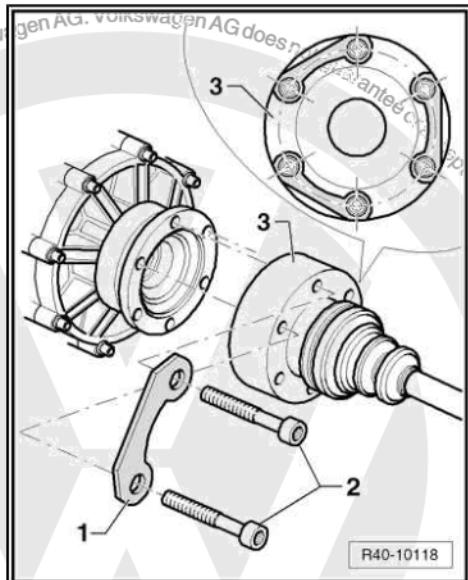
- Install the drive shaft -3- on the gearbox drive flange and tighten the fastening screws -2-. Tightening torque, see [⇒ page 144](#).

Continuation for vehicles without ABS:

- Installation of the drive shaft on the roller bearing case for vehicles without ABS

Install the drive shaft on the wheel roller bearing case as follows:

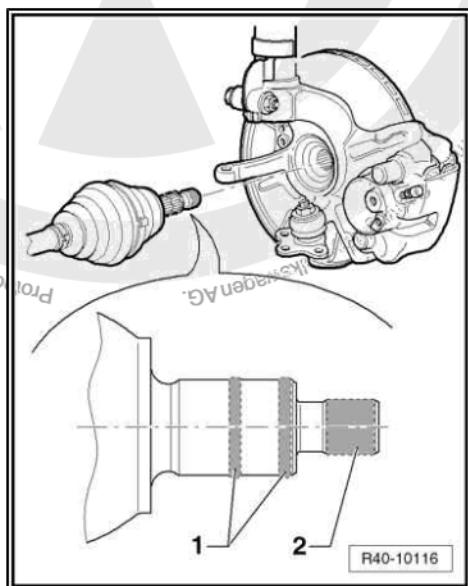
- Clean the surfaces from the thread and the toothed area.



- Lubricate the toothed area -1- using Molybdenum Paste - G 052 751 A1-. Refer to the ⇒ Chemicals Manual .
- Lubricate the thread on the axle tip -2- and the thread on the fastening nut using Micro oil . Refer to the ⇒ Chemicals Manual .
- Install the drive shaft on the wheel roller bearing case.

Continued for vehicles with ABS (FS II brake calipers - 13" wheel running gear):

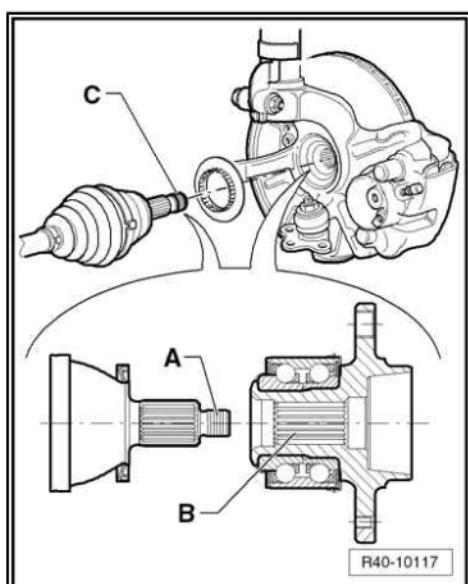
- Installation of the drive shaft into the wheel hub bearing housing for vehicles (FS II brake calipers 13" wheel running gear) with ABS



Install the drive shaft on the wheel roller bearing case as follows:

- Clean the surfaces from the thread and the toothed area.

- Apply the Liquid sealant - D 185 400 A3- onto the shaft end thread -A- or onto the fastening nut thread. Refer to the ⇒ Chemicals Manual .

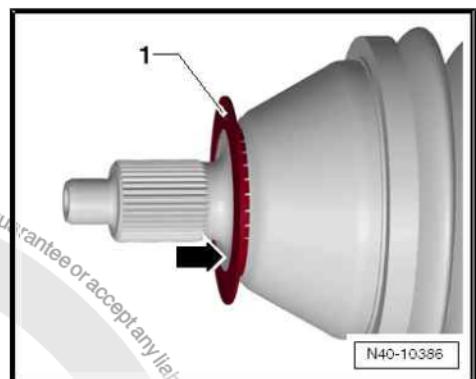




Note

The deflector ring -1- must be aligned to the touch surface of the outer joint -arrow-.

- Apply 2g of Liquid sealant - D 185 400 A3- on zone -B-. Refer to the ⇒ Chemicals Manual.
- The zones where the Liquid sealant - D 185 400 A3- will be applied must be free of grease, oil, water or any other material.
- Install and tighten the grooved nut (dodecahedron). Tightening torque, see ⇒ [page 136](#)



**WARNING**

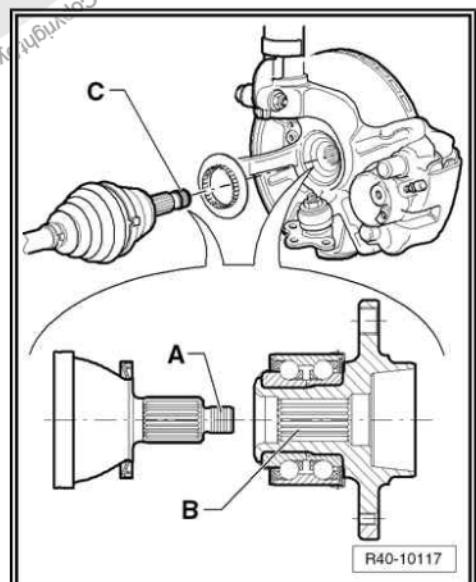
*Torque must be applied within at most 2 minutes after inserting the drive shaft onto wheel hub. After finishing applying the tightening torque, the vehicle must remain at least 1.5 hour at rest without load on the drive shaft (only parking manoeuvres allowed).*

Continued for vehicles with ABS (FS III brake calipers - 14" and 15" wheels running gear):

- Installation of the drive shaft into the wheel hub bearing housing for vehicles (FS III brake calipers 14" and 15" wheels running gear) with ABS

Install the drive shaft on the wheel roller bearing case as follows:

- Clean the surface of the threads on the axle tip -A- and the toothed area -B-.





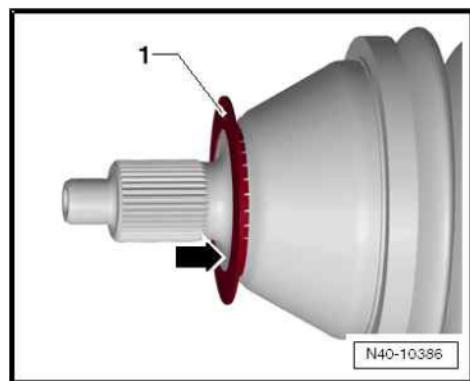
Note

The deflector ring -1- must be aligned to the touch surface of the outer joint -arrow-.

- Install the drive shaft on the wheel roller bearing case.

Continuation for all vehicles:

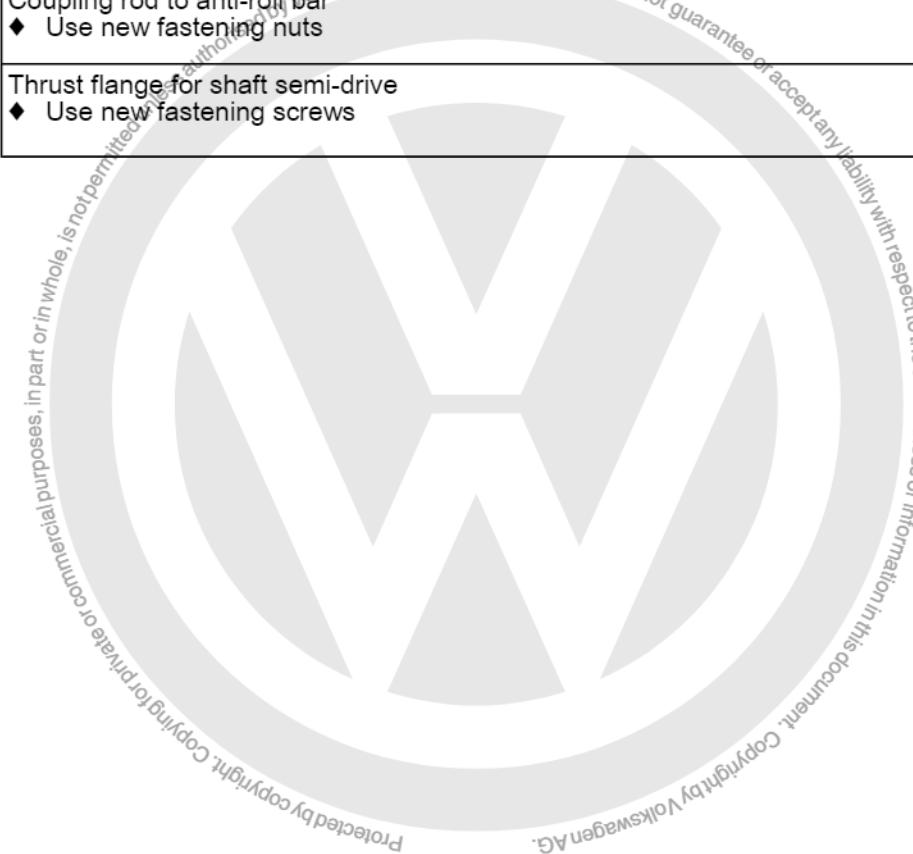
- Install the fastening screws (screws on the old markings) for the wishbone swivel guide. Tightening torque, see [⇒ page 144](#) .
- Install the coupling rod. Tightening torque, see [⇒ page 144](#) .
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see [⇒ page 144](#) .
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#) .
- Install and tighten the grooved nut (dodecahedron). Tightening torque, see [⇒ page 136](#)



N40-10386

Tightening torques

Components	Tightening torque
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm
Thrust flange for shaft semi-drive ◆ Use new fastening screws	Pre-torque to 10 Nm and then to 20 Nm + 180°

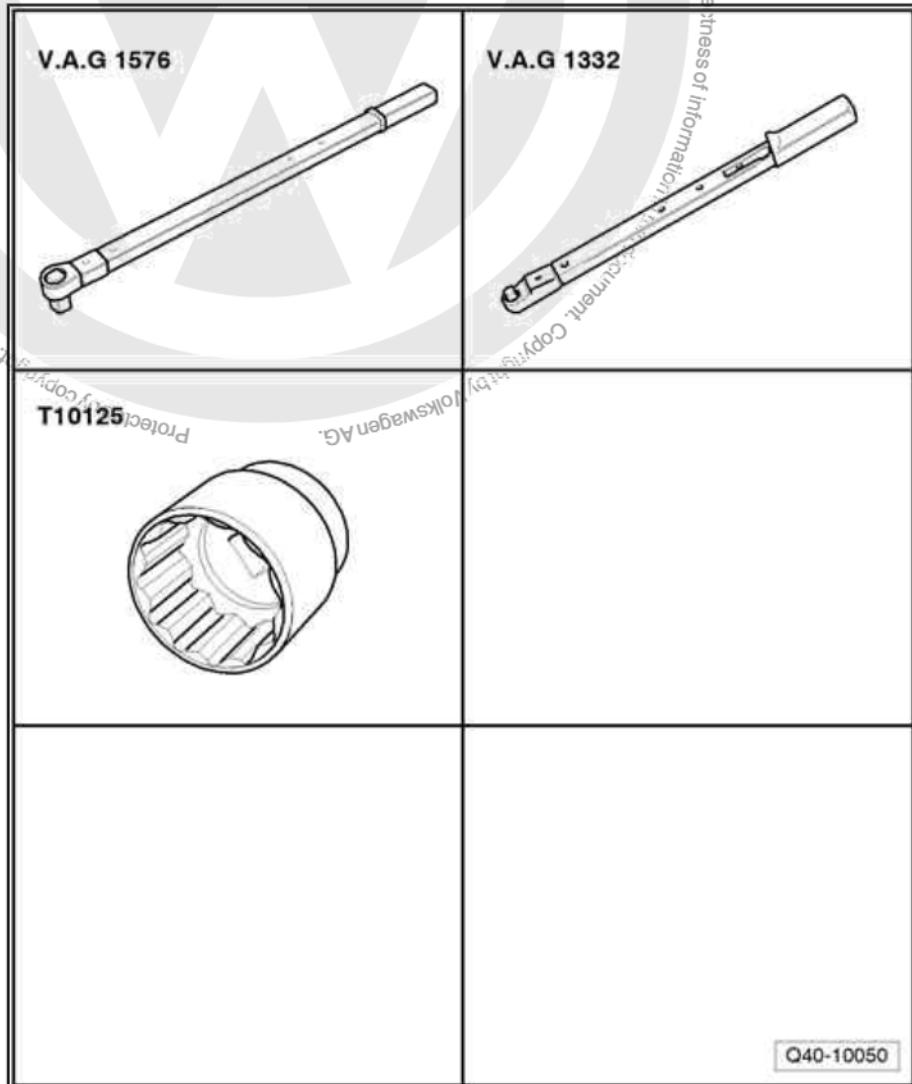




11 Constant velocity drive shaft (04/13►)  
- remove and install

11.1 Fastening nut (dodecahedron) of the drive shaft (04/13►) - loosen and tighten-

Special tools and workshop equipment required



- ◆ "Torque wrench - 75 to 400 Nm (fit. 3/4" drive) - VAG 1576-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ 36 mm Grooved Socket - T10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ 30 mm Grooved Socket (Gedore ref. D32-30)



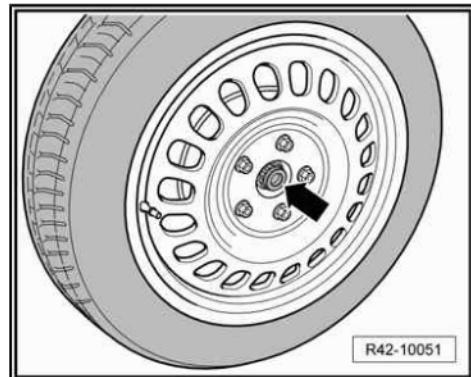
### 11.1.1 Loosen the fastening nut (dodecahedron) (04/13►)

- With the vehicle still sitting on its wheels, loosen the fastening nut (dodecahedron) -arrow- by, at the most,  $90^\circ$  (1/4 turn), so as not to damage the wheel bearing.



#### WARNING

*Loosen the dodecahedron nut only by "90° at the most", or (1/4 turn), so as not to damage the wheel hub and bearing*



- For vehicles with ABS breaks, use the 36mm grooved socket - T10125- or 36mm grooved socket (Gedore ref. D32-36)
- For vehicles without ABS breaks, use the 30mm grooved socket (Gedore ref. D32-30)
- Elevate the vehicle until the front axle is unloaded (wheels suspended) ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, vehicle elevation .

And follow the following instructions:

- Activate the brake pedal and at the same time hold the steering wheel so that the wheels are straight ahead, with help from a second person
- Loosen and completely remove the fastening nut (dodecahedron).



#### WARNING

- When the fastening nuts (dodecahedron) of the drive shafts are loosened from the external sides of their wheels, the wheel hub and bearing set must not be overloaded. However, the vehicle must have its wheels suspended to avoid damage to the wheel hub and bearing (thus reducing the useful life of the set)*
- Vehicles without their semi-drive shafts with constant velocity joints must not be moved*

### 11.1.2 Tighten the fastening nut (dodecahedron) (04/13►)

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

- Always replace self-locking nuts and bolts subject to angular torque*
- Remove any residues of paint and/or corrosion on thread/splines from the external constant-velocity joint*
- The vehicle must have its wheels suspended to avoid damage to the wheel hub and bearing (thus reducing the useful life of the set)*
- Vehicles without their semi-drive shafts with constant velocity joints must not be moved*



Use new fastening nuts!

- Install the fastening nut (dodecahedron) in the drive shaft.

 Note

*The vehicle must have its wheels suspended to avoid damage to the wheel hub and bearing*

With the vehicle raised, one must:

- Activate the brake pedal and at the same time hold the steering wheel so that the wheels are straight ahead, with help from a second person.
- Tighten the fastening nut (dodecahedron). Tightening torque, see [⇒ page 137](#).

Tightening torques

Components	Tightening torque
Dodecahedron nut for vehicles (without ABS) <ul style="list-style-type: none"> <li>◆ Use new fastening nuts</li> </ul>	<ul style="list-style-type: none"> <li>◆ Pre-tighten with 200 + 50 Nm of torque and loosen 180°(1/2 turn)</li> <li>◆ Tighten with a final torque of 50 Nm + 50°</li> </ul>
Dodecahedron nut for vehicles with ABS (FS II brake caliper - 13" wheel running gear) <a href="#">⇒ page 137</a> <ul style="list-style-type: none"> <li>◆ Use new fastening nuts</li> <li>◆ Fastening nut (black)</li> <li>◆ Firstly, apply Liquid Sealant - D 185 400 A3- onto the already properly cleaned groove and external thread of the drive shaft. Refer to the <a href="#">⇒ Chemicals Manual</a></li> </ul>	50 Nm
Dodecahedron nut for vehicles with ABS (FS III brake caliper - 14" and 15" wheels running gear) <ul style="list-style-type: none"> <li>◆ Use new fastening nuts</li> <li>◆ Fastening nut (silver)</li> </ul>	50 Nm + 45°



**WARNING**

*For vehicles (13" wheels running gear with ABS), the torque must be applied within at most 2 minutes after inserting the drive shaft into the wheel hub. After finishing torquening, the vehicle must remain at least 1.5 hour without effort onto the drive shaft (only parking manoeuvres allowed)*



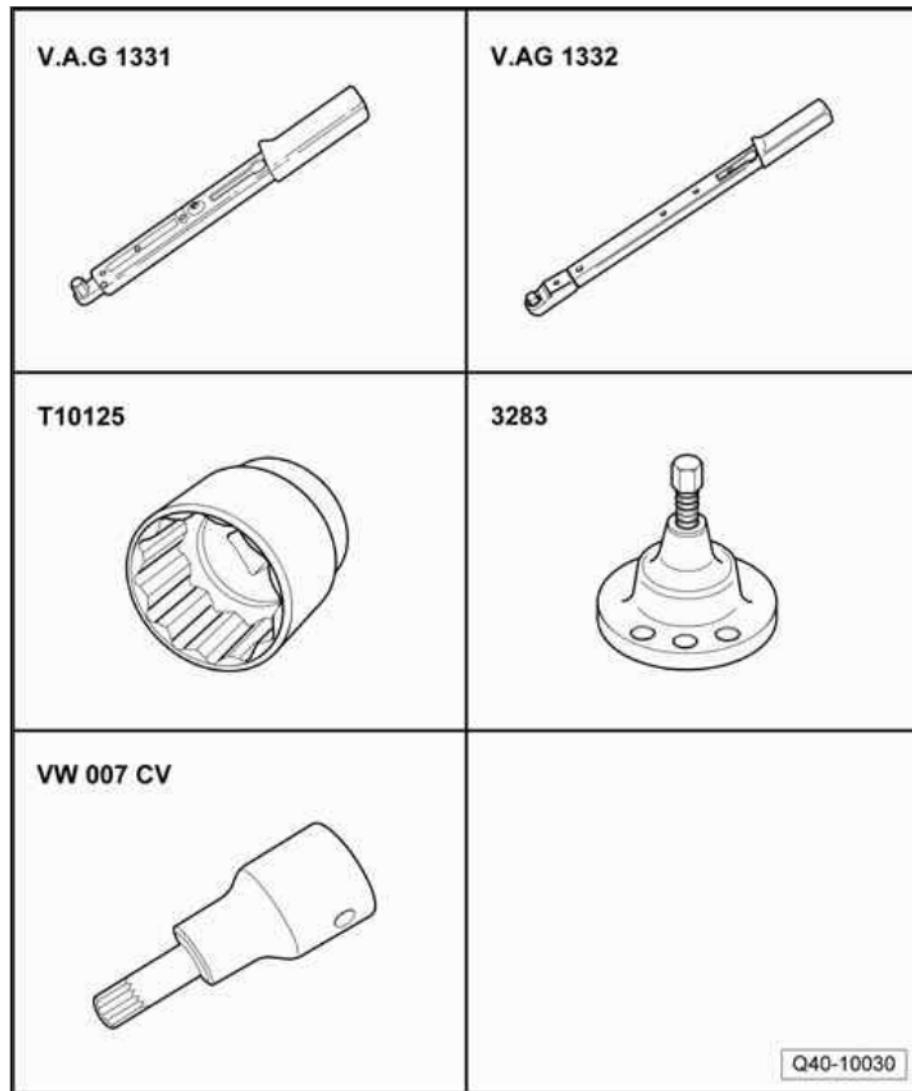
## 11.2 Constant velocity drive shaft (04/13►) - remove and install



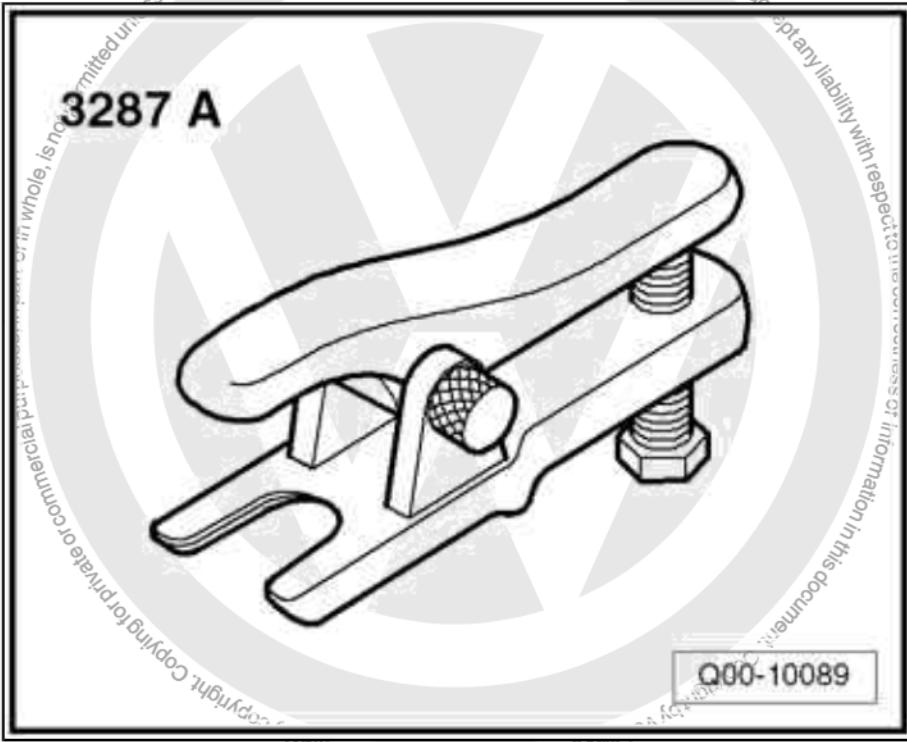
### WARNING

- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ The only operation authorized by VW engineering is the replacement of the complete drive shafts (external or internal) and the respective boots

Special tools and workshop equipment required



- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ 36 mm Grooved Socket - T10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ Puller - 3283-
- ◆ Multi-teeth socket M8 (enc.1/2") - VW 007CV-



◆ Puller - 3287A-

### 11.2.1 Removal

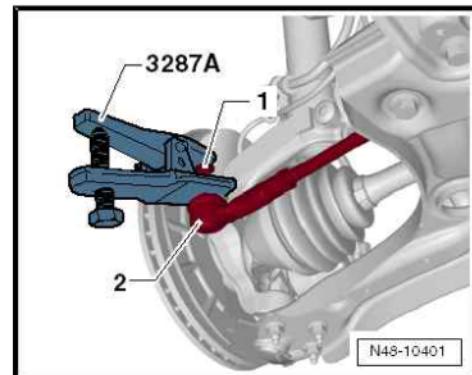
- Loosen the fastening nut (dodecahedron) from the drive shaft  
⇒ [page 135](#).
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Slightly release the fastening screws of the articulated axle from the gearbox drive flange.
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



#### WARNING

*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

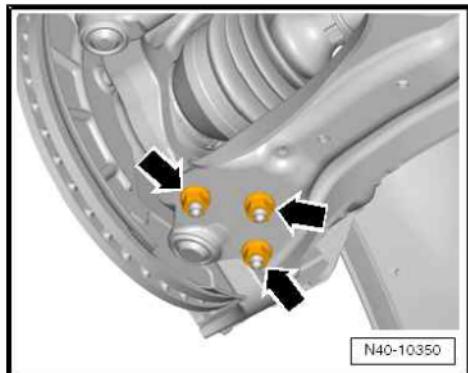
- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .





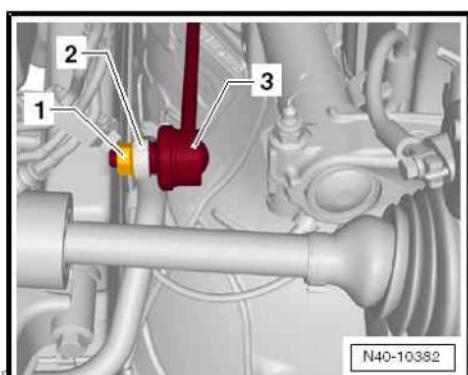
- Remove the mounting nuts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

Continuation for vehicles with anti-roll bar:



- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.

Continuation:



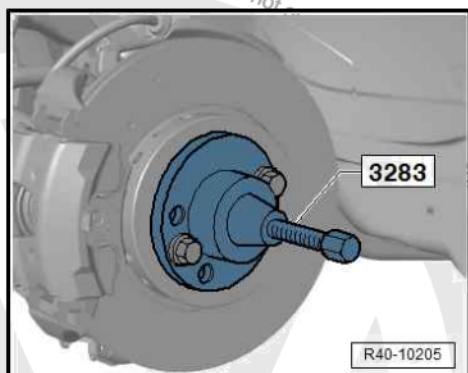
- Press the drive shaft out of the roller bearing case. To do this, install the Puller - 3283- as shown in the figure.



Note

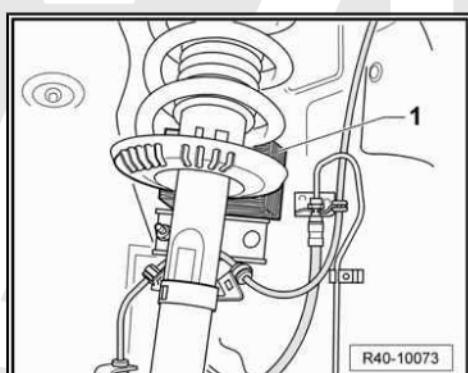
*While the drive shaft is being pressed outwards, observe if there is enough free space.*

- Remove the wheel roller bearing case with the shaft articulation out of the wishbone.
- Pull the suspension strut outward and support it with a wooden block -1- (for example) and simultaneously remove the drive shaft out from the wheel roller bearing.
- Fasten the drive shaft to the body with the aid of a wire.



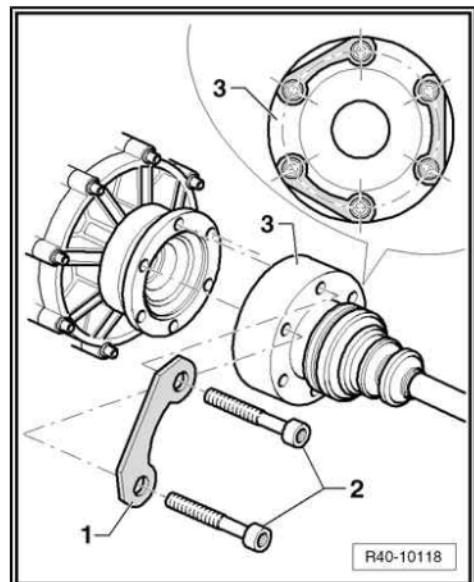
Note

*The drive shaft must not be pushed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*





- Loosen and remove the fastening screws -2- and the seating plates -1-, using the Multi-tooth socket M8 (enc.1/2") - VW 007CV- .
- Remove the drive shaft -3-.



### 11.2.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Check if the boots for the drive shaft are not damaged or twisted
- ◆ Remove any residues of paint and/or corrosion on thread/splines from the external constant-velocity joint

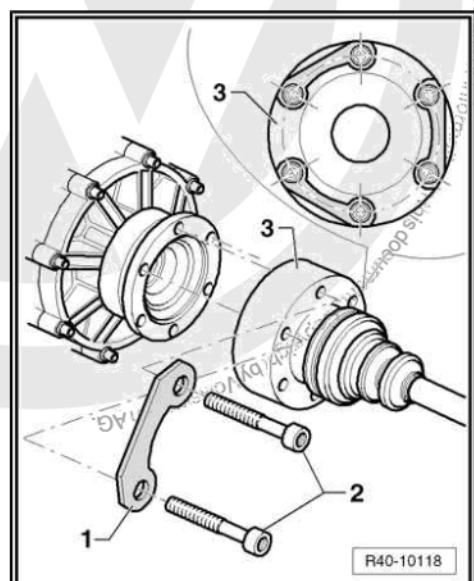
- Install the drive shaft -3- on the gearbox drive flange and tighten the fastening screws -2-. Tightening torque, see [⇒ page 144](#) .

Continuation for vehicles without ABS:

- Installation of the drive shaft on the roller bearing case for vehicles without ABS.

Install the drive shaft on the wheel roller bearing case as follows:

- Clean the surfaces from the thread and the toothed area.





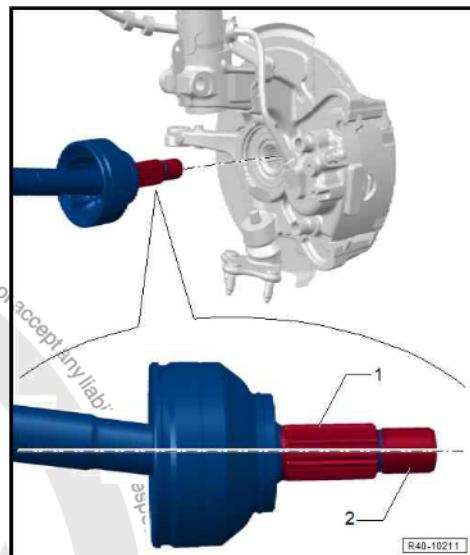
- Lubricate the toothed area -1- using Molybdenum Paste - G 052 751 A1- . Refer to the ⇒ Chemicals Manual .
- Lubricate the thread on the axle tip -2- and the thread on the fastening nut using Micro oil . Refer to the ⇒ Chemicals Manual .
- Install the drive shaft on the wheel roller bearing case.

Continued for vehicles with ABS (FS II brake calipers - 13" wheel running gear):

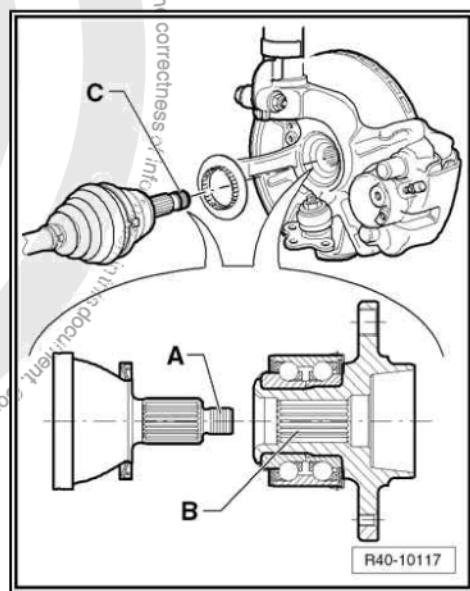
- Installation of the drive shaft into the wheel hub bearing housing for vehicles (FS II brake calipers 13" wheels) with ABS.

Install the drive shaft on the wheel roller bearing case as follows:

- Clean the surfaces from the thread and the toothed area.



- Apply the Liquid sealant - D 185 400 A3- onto the shaft end thread -A- or onto the fastening nut thread. Refer to the ⇒ Chemicals Manual .

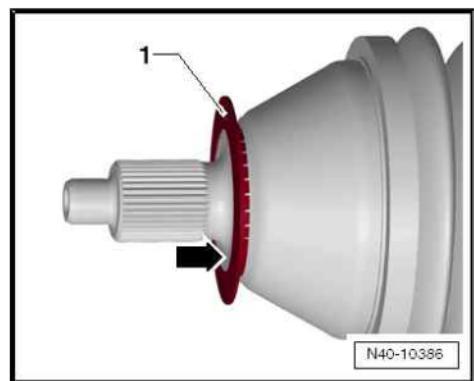




Note

The deflector ring -1- must be aligned to the touch surface of the outer joint -arrow-.

- Apply 2g of Liquid sealant - D 185 400 A3- on zone -B-. Refer to the ⇒ Chemicals Manual .
- The zones where the Liquid sealant - D 185 400 A3- will be applied must be free of grease, oil, water or any other material.
- Install and tighten the grooved nut (dodecahedron). Tightening torque, see ⇒ [page 146](#)



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WARNING

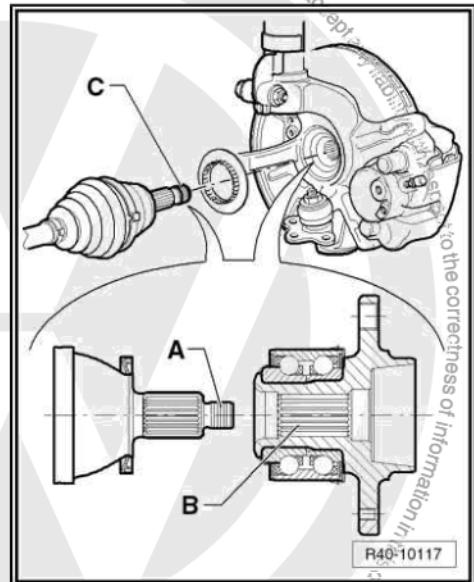
*Torque must be applied within at most 2 minutes after inserting the drive shaft onto wheel hub. After finishing applying the tightening torque, the vehicle must remain at least 1.5 hour at rest without load on the drive shaft (only parking manoeuvres allowed).*

Continued for vehicles with ABS (FS III brake calipers - 14" and 15" wheels running gear):

- Installation of the drive shaft into the wheel hub bearing housing for vehicles (FS III brake calipers 14" and 15" wheels) with ABS.

Install the drive shaft on the wheel roller bearing case as follows:

- Clean the surface of the threads on the axle tip -A- and the toothed area -B-.



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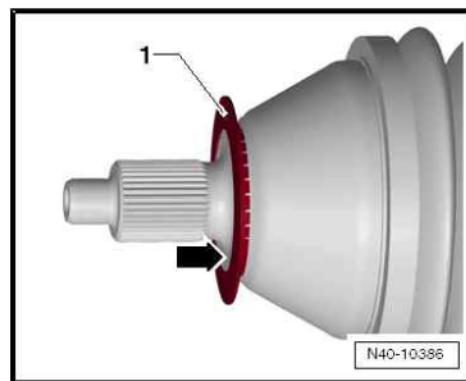
Note

The deflector ring -1- must be aligned to the touch surface of the outer joint -arrow-.

- Install the drive shaft on the wheel roller bearing case.

Continuation for all vehicles:

- Install the fastening screws (screws on the old markings) for the wishbone swivel guide. Tightening torque, see [⇒ page 144](#) .
- Install the coupling rod. Tightening torque, see [⇒ page 144](#) .
- Install the steering terminal in the wheel roller bearing case. Tightening torque, see [⇒ page 144](#) .
- Install the front wheel and tighten the screws. Tightening torque, see [⇒ page 203](#) .
- Install and tighten the grooved nut (dodecahedron). Tightening torque, see [⇒ page 146](#)



N40-10386

Tightening torques

Components	Tightening torque
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm
Thrust flange for shaft semi-drive ◆ Use new fastening screws	Pre-torque to 10 Nm and then to 20 Nm + 180°



## 12 IV - Drive shaft with constant velocity joint - repair



### WARNING

- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ The only operation authorized by VW engineering is the replacement of the complete drive shafts (external or internal) and the respective boots

### 12.1 Drive shaft with constant velocity joint - assembly overview

#### 1 - Grooved nut (dodecahedron)

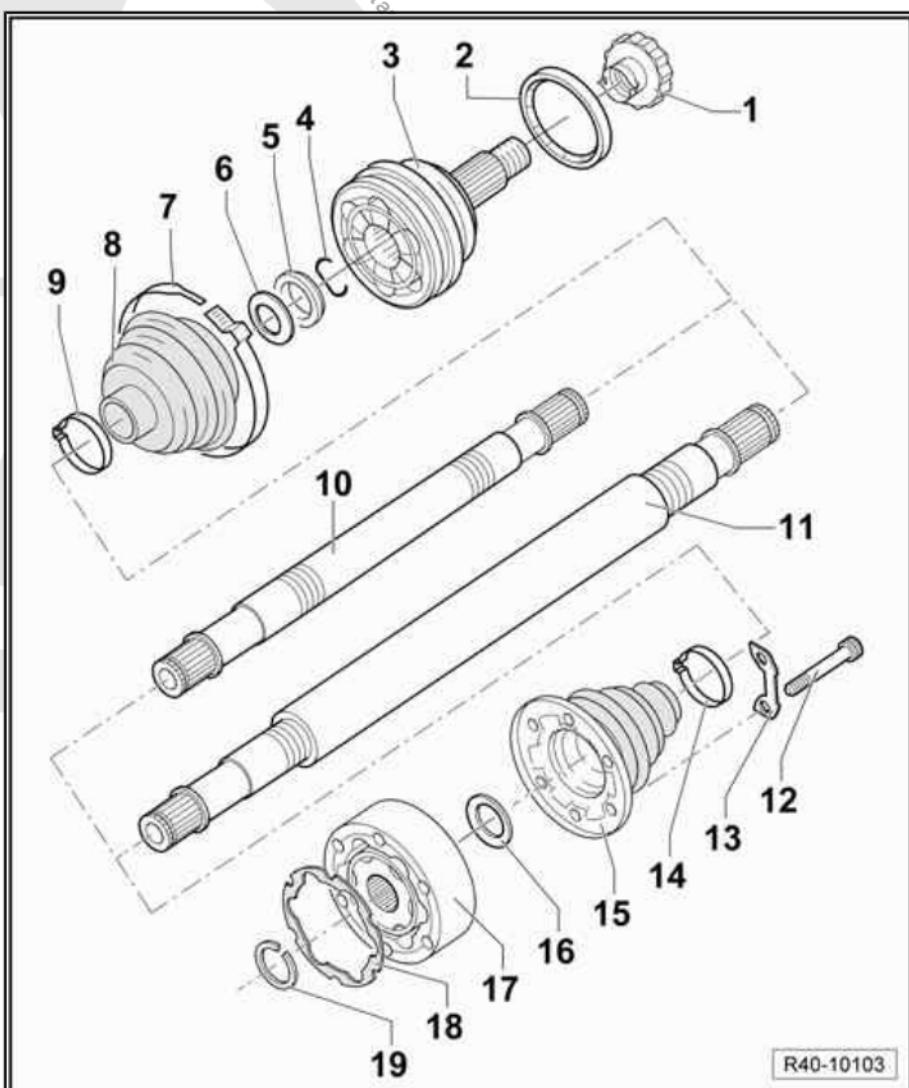
- Self-locking
- Replace once removed
- See: ⇒ Electronic parts catalogue "ETKA"

#### For vehicles without ABS:

- ◆ Pre-tighten to 200 + 50 Nm, then loosen (turn back) 180°, and retighten to 50 Nm + 50°, consult [⇒ page 135](#)
- ◆ Installing the drive shaft on the roller bearing case [⇒ page 142](#)

#### For vehicles with ABS (FS II brake calipers - 13" wheels running gear):

- ◆ Firstly, apply Liquid Sealant - D 185 400 A3- onto the already properly cleaned groove and external thread of the drive shaft. Refer to the ⇒ Chemicals Manual
- ◆ Tightening torque for 13" wheels running gear (FS II brake caliper) silver colour fastening nut = 50 Nm + 45°, consult [⇒ page 135](#)
- ◆ Installing the drive shaft on the roller bearing case [⇒ page 142](#)





#### WARNING

*Torque must be applied within at most 2 minutes after inserting the drive shaft onto wheel hub. After finishing applying the tightening torque, the vehicle must remain at least 1.5 hour at rest without load on the drive shaft (only parking manoeuvres allowed).*

For vehicles (14" and 15" wheel running gear - FS III brake calipers) with ABS:

- ◆ Tightening torque for 14" and 15" wheel running gear - (FS III brake caliper - silver colour fastening nut) = 50 Nm + 45°, consult [page 135](#)
- ◆ Installing the drive shaft on the roller bearing case [page 143](#)

2 - Deflector ring

3 - External constant-velocity joint

- Full replacement only
- Remove
- Install in the drive shaft until the limit with a plastic hammer

4 - Retaining ring

- Replace once removed
- Install in the shaft groove

5 - Retainer seal

6 - Dish spring

- Ø external (concave side) in contact with retainer

7 - Clamp

- Replace once removed
- Fasten [page 161](#)

8 - Internal constant-velocity joint protective boot

- Check for cracks and wear

9 - Clamp

- Replace once removed
- Fasten [page 161](#)

10 - Left drive shaft (solid shaft)

11 - Right drive shaft (tubular shaft)

12 - Internal grooved bolt

- Replace once removed
- Apply 10Nm of pre-torque to all screws
- 20 Nm + 180°

13 - Plate

14 - Clamp

- Replace once removed
- Fasten [page 161](#)

15 - Constant-velocity joint protective boot

- Check for cracks and wear



16 - Dish spring

- Ø internal splined
- Installation position: Ø external (concave side) in contact with joint

17 - Internal constant-velocity joint

- Only replace complete
- Remove [⇒ page 160](#)
- Install [⇒ page 161](#)

18 - Gasket

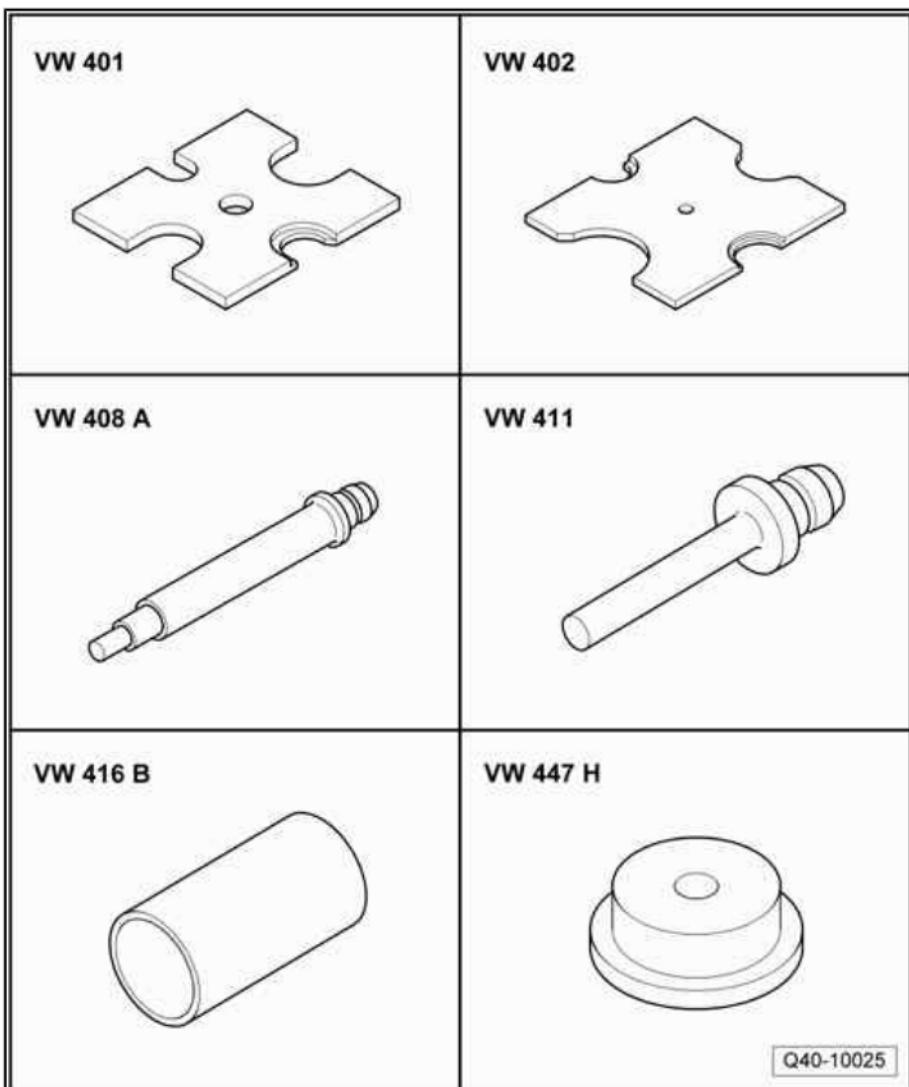
- Replace, removing the protective film, and paste to the joint.

19 - Retaining ring

- Replace once removed
- Remove and install with the Pliers or VW 5161A - VW 161A-

## 12.2 Drive shaft with constant velocity joint - repair

Special tools and workshop equipment required

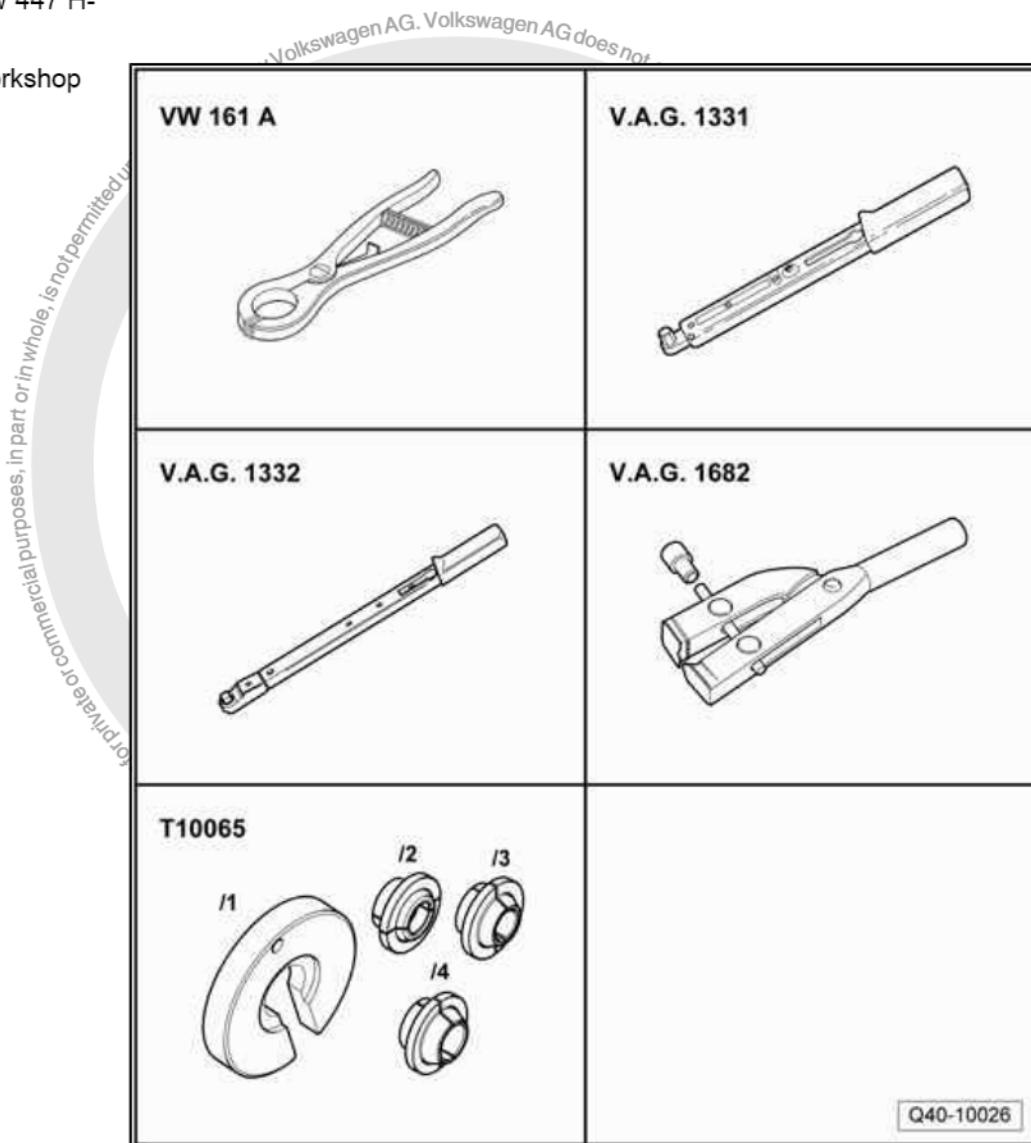


- ◆ Press plate - VW 401-
- ◆ Press plate - VW 402-

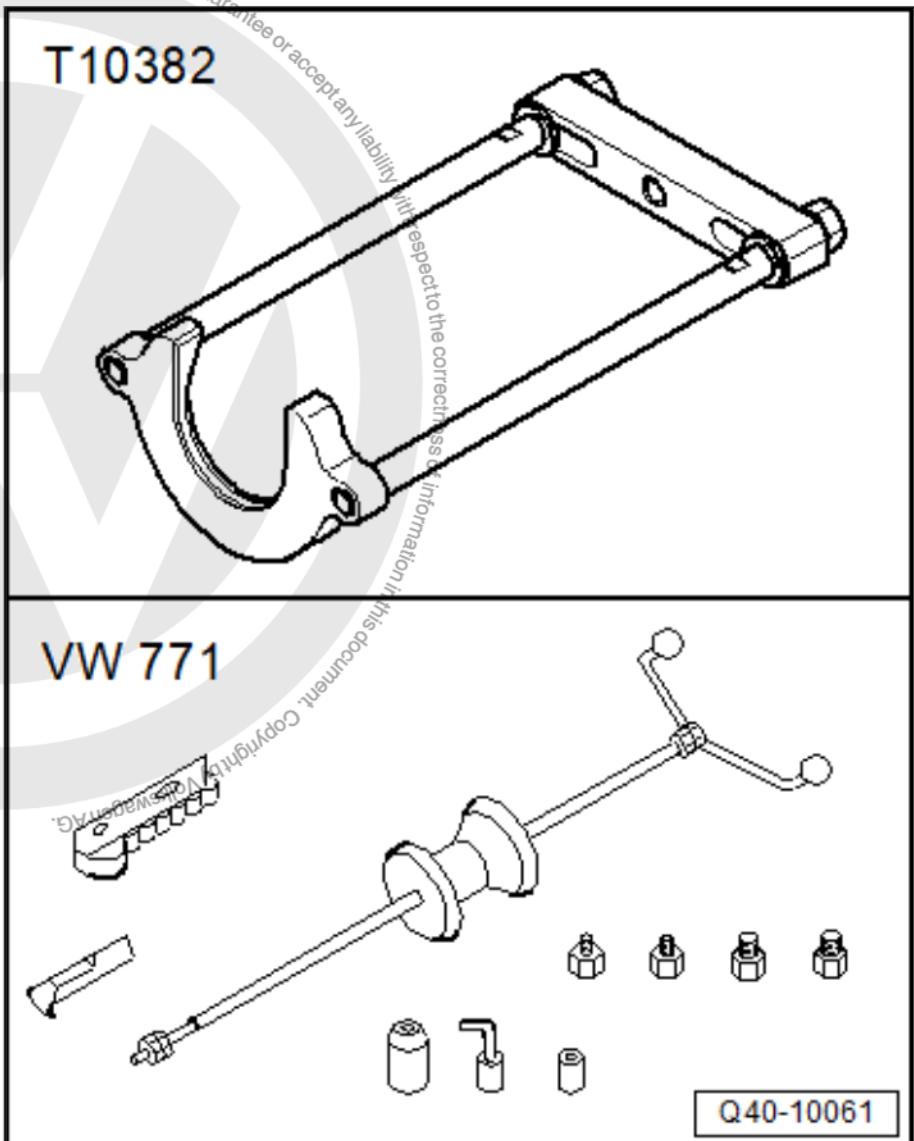


- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 411-
- ◆ Press tube - VW 416 B-
- ◆ Thrust piece - VW 447 H-

Special tools and workshop equipment required



- ◆ Pliers or VW 5161A - VW 161A-
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Device for clamps - VAG 1682-
- ◆ Assembly tool - T10065-



- ◆ Puller - T10382-
- ◆ Multi-purpose tool - VW 771-

**Grease quantities and types:**

The constant-velocity joints are stored with Grease - G 000 603-.  
 Refer to the ⇒ Chemicals Manual .

External constant-velocity joint	Grease		of total for the	
	Total quantity		Articulation	Protective boot
Ø mm	[g]	[g]	[g]	[g]
85	80	40	40	

Internal constant-velocity joint	Grease		of total for the	
	Total quantity		Articulation	Protective boot
Ø mm	[g]	[g]	[g]	[g]
90	80	40	40	

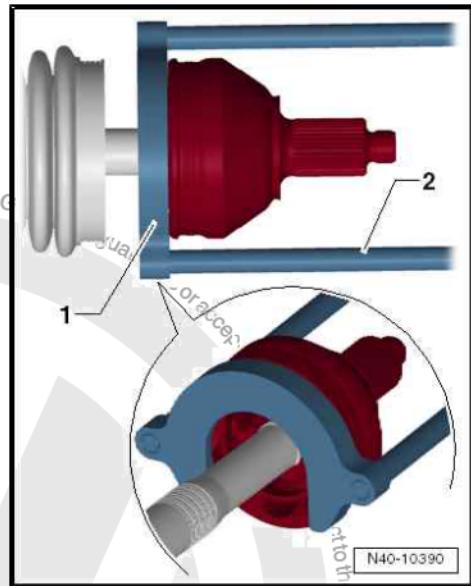


Lubricate the joint with grease, if necessary, when replacing the protective boot.

⇒ [page 156](#) Remove the outer constant-velocity joint

- Remove from the drive shaft through vigorously pounding with an aluminium hammer.
- Secure the drive shaft with protectors in the vise.
- Open the clamp.
- Turn the boot backwards.
- Place the puller - T10382- so that the smooth side of the puller plate - T10382/1- points towards the spindles - T10382/2- .
- Assemble the complete puller - T10382- using the multi-purpose tool - VW 771- .
- Extract the constant velocity joint from the drive shaft using the puller - T10382- and the multi-purpose tool - VW 771- .

1 - Puller plate - T10382/1-  
2 - Fuses - T10382/2-

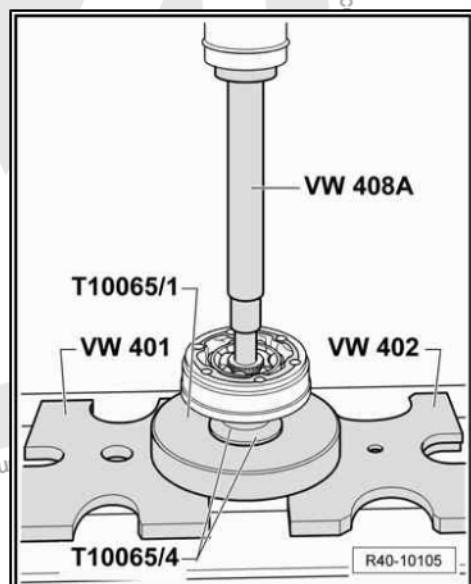


Remove the internal constant-velocity joint



Note

*First, remove the protective boot from the joint with the help of a drift*



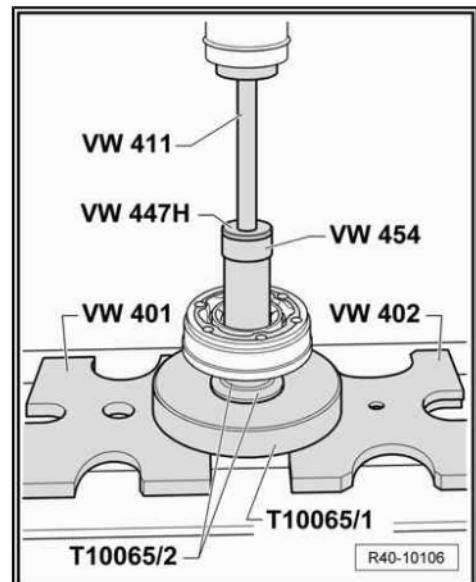


### Install the internal constant-velocity joint

- Press the joint to the stop.
- Install the circlip.



*The ball hub internal diameter chamfer (splined) must face the drive shaft shoulder*

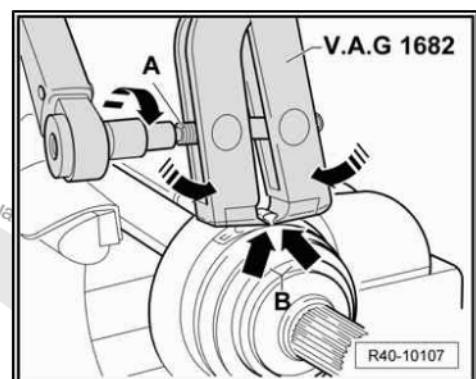


### Install the clamp on the external joint

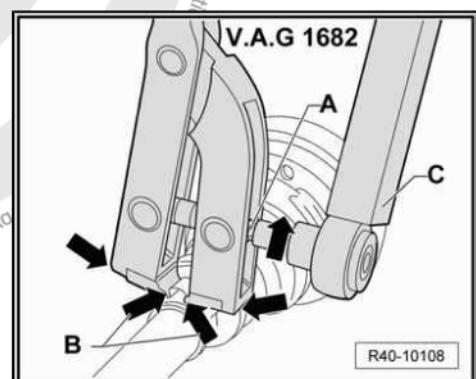
- Install the Device for clamps - VAG 1682- as shown in the illustration. When doing this, make sure that the pliers claws fit the ends -arrow B- of the clamp.
- Tighten the clamp by turning the spindle with a torque wrench (do not tilt the pliers).



- ◆ Due to the hardness of the material of the constant-velocity joint protective boot (in comparison to rubber) a stainless steel clamp must be used, which can only be tightened with the Device for clamps - VAG 1682-
- ◆ Tightening torque: 25 Nm
- ◆ Use "Torque wrench - 5 to 50 Nm (fit. 1/2")" - VAG 1331- -C-
- ◆ Make sure that the spindle from thread -A- does not lock. If necessary, lubricate it with Lubricating grease MoS2. Refer to the ⇒ Chemicals Manual
- ◆ If the thread is seized, for example, due to dirtiness, the necessary tension for the clamp will not be reached according to the tightening torque specified



### Install the clamp in the internal joint protective boot (smaller diameter)





## 42 – Rear suspension

### 1 Rear suspension - repairing

#### 1.1 Rear suspension with wheel roller bearing (without adjustment) - assembly overview



##### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
⇒ [page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Soldering and straightening operations are not permitted on the suspension supporting components or on those components in which the wheels are mounted
- ◆ Always replace corroded or rusted screws/nuts



##### Note

When replacing components with metal and rubber supports, or when bolts/nuts have been removed from such components, you must lift the unloaded axle before tightening ⇒ [page 168](#).





1 - Axle beam

- The contact surfaces of the shaft end and threaded holes must be free from paint and dirt
- Remove the rear axle  
[⇒ page 171](#)

2 - Lower spring plate

- check plates for damages

3 - Coil spring

- observe the colour coding
- See: ⇒ Electronic parts catalogue "ETKA"

Spring correspondence through the PR number

These numbers are indicated in the vehicle identification tag

- The spiral spring surface must not be damaged

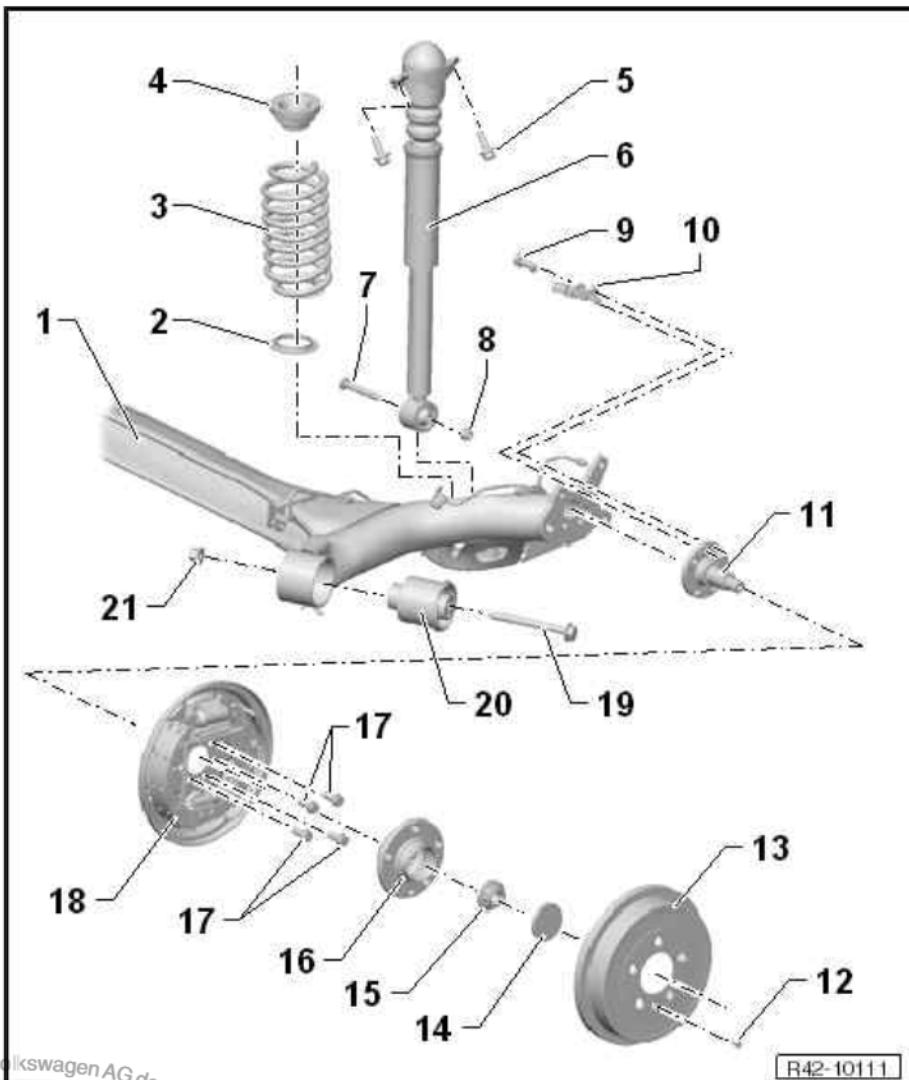
4 - Spring seat

5 - Hexagon socket head bolt

- 30 Nm + 90°
- Replace once removed

6 - Shock absorber

- Correspondence ⇒ Electronic Parts Catalogue "ETKA".
- Remove and install  
[⇒ page 181](#)
- Note the assembly position [⇒ page 183](#)



**WARNING**

Only shock absorbers of the same brand "Supplier" can be mounted in the same vehicle.

7 - Hexagonal bolt

- 40 Nm + 90°
- Replace once removed

8 - Hexagonal nut

- Self-locking
- Replace once removed

9 - Internal hex head bolt

- 8 Nm

10 - ABS speed sensor

- Before installing the sensor, the internal surface of the orifice must be cleaned and apply Polyurethane grease - G 052 142 A2-. Refer to the ⇒ Chemicals Manual



11 - Axle end

- Straightening operations are not permitted
- Recutting the thread is not permitted

12 - Screw

- 4 Nm

13 - Brake drum

- Remove and install [Brake systems; Rep. gr. 46 ; Brakes - Mechanical systems](#)

14 - Dust protection cover

- Replace once removed
- Remove and install [page 185](#)

A perfect seal is only achieved by using a new dust protection cover

This is the only way to ensure optimal operation and high durability of the roller bearing

15- Grooved nut (dodecahedron)

- Self-locking
- 70 Nm + 30°
- Replace once removed

16 - Wheel hub with roller bearing

- The ABS sensor ring is installed in the wheel hub
- Remove and install [page 185](#)

The wheel roller bearing and the wheel hub are installed together in a housing

This wheel roller bearing/hub set is maintenance- and clearance-free. Adjustment and repair works are not possible.

17 - Hexagon socket head bolt

- 30 Nm + 90°
- Replace once removed

18 - Rear brake plate with brake shoes

- Repair [Brake system; Rep. gr. 46 ; Brakes - Mechanical systems](#)

19 - Screw

- Install from outside
- Replace once removed

20 - Bonded rubber bush

- Remove and install [page 175](#)

21 - Hexagonal nut

- Self-locking
- 45 Nm + 90°
- Replace once removed



## 1.2 Rear suspension with wheel bearing roller (with adjustment) - assembly overview



### WARNING

- ◆ Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required.  
[⇒ page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Soldering and straightening operations are not permitted on the suspension supporting components or on those components in which the wheels are mounted
- ◆ Always replace corroded or rusted screws/nuts



### Note

When replacing components with metal and rubber supports, or when bolts/nuts have been removed from such components, you must lift the unloaded axle before tightening [⇒ page 168](#).

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1 - Axle beam

- The contact surfaces of the shaft end and threaded holes must be free from paint and dirt
- Remove the rear axle  
[⇒ page 171](#)

2 - Lower spring plate

- check plates for damages

3 - Coil spring

- observe the colour coding
- See: [Electronic parts catalogue "ETKA"](#)

Spring correspondence through the PR number

These numbers are indicated in the vehicle identification tag

- The spiral spring surface must not be damaged

4 - Spring seat

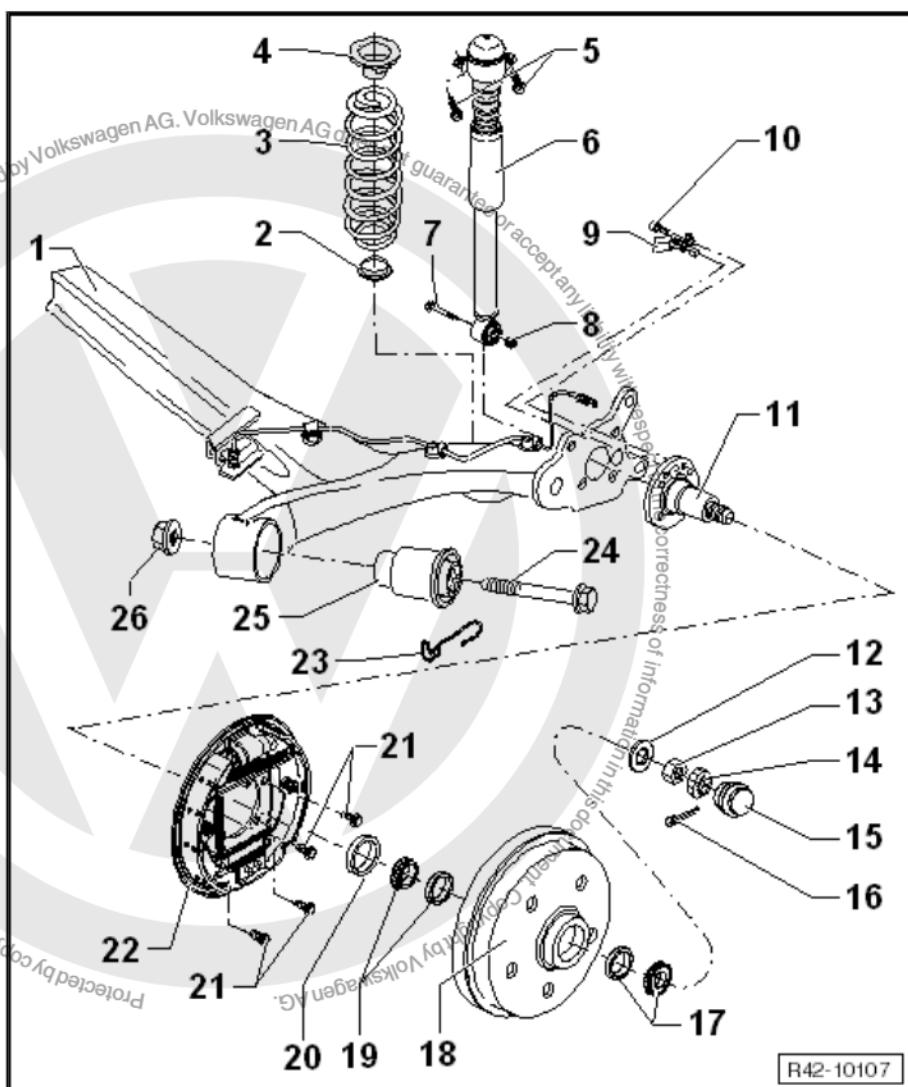
5 - Hexagon socket-head bolt

- 30 Nm + 90°
- Replace once removed

6 - Shock absorber

- Correspondence ⇒ [Electronic Parts Catalogue "ETKA"](#) .
- Remove and install  
[⇒ page 181](#)

- Note the assembly position [⇒ page 183](#)



R42-10107



**WARNING**

*Only shock absorbers of the same brand "Supplier" can be mounted in the same vehicle.*

7 - Hexagonal bolt

- 40 Nm + 90°
- Replace once removed

8 - Hexagonal nut

- Self-locking
- Replace once removed

9 - ABS speed sensor

- Before installing the sensor, the internal surface of the orifice must be cleaned and apply Polyurethane grease - G 052 142 A2- . Refer to the ⇒ [Chemicals Manual](#)

10 - Internal hex head bolt

- 8 Nm



11 - Axle end

- Straightening operations are not permitted
- Recutting the thread is not permitted

12 - Thrust washer

13 - Hexagonal nut

- Adjust [⇒ page 191](#)

14 - Sprocket

15 - Wheel hub protection

- Replace once removed

16 - Cotter pin

- Replace once removed

17 - Rear wheel external roller bearing

- Adjust [⇒ page 191](#)
- Remove and install [⇒ page 194](#)

18 - Brake drum

- Remove and install [⇒ Brake systems; Rep. gr. 46 ; Brakes - Mechanical systems](#)

19 - Rear wheel internal roller bearing

- Adjust [⇒ page 191](#)
- Remove and install [⇒ page 194](#)

20 - Rear wheel internal roller bearing seal

- Replace once removed

21 - Hexagon socket head bolt

- 30 Nm + 90°
- Replace once removed

22 - Rear brake plate with brake shoes

- Repair [⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems](#)

23 - Handbrake cable bracket

24 - Screw

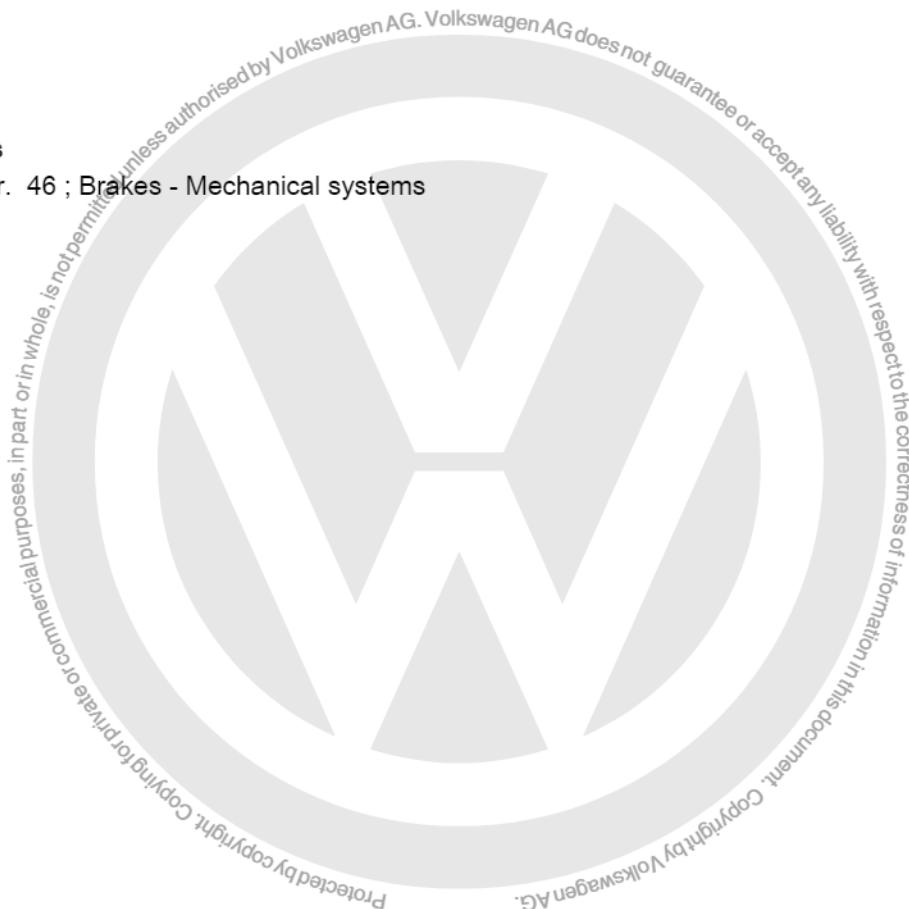
- Install from outside
- Replace once removed

25 - Bonded rubber bush

- Remove and install [⇒ page 175](#)

26 - Hexagonal nut

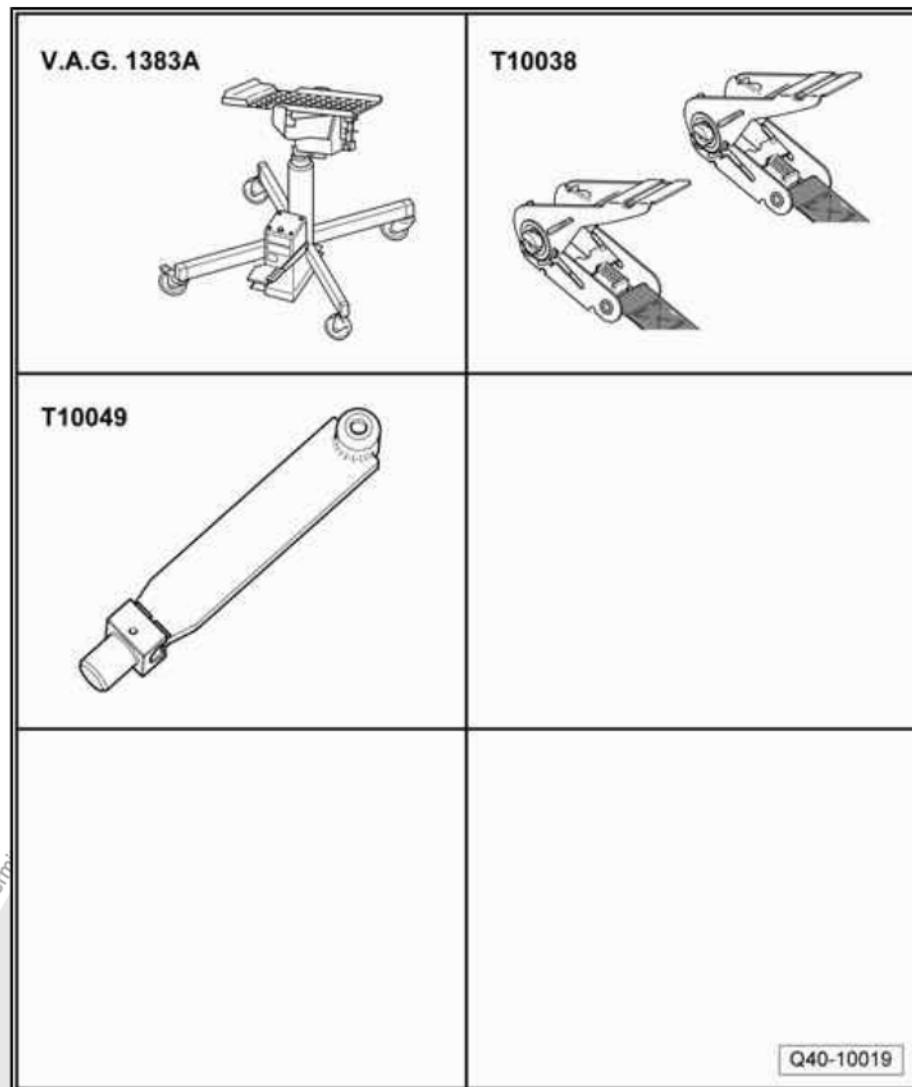
- Self-locking
- 45 Nm + 90°
- Replace once removed





## 1.3 Lift the rear axle in the unloaded position

Special tools and workshop equipment required



- ◆ Gearbox jack or gearbox + engine set or EQ 7081 - VAG 1383A-
- ◆ Tensioning strap - T10038-
- ◆ Mounting bracket - T10149-



### WARNING

- ◆ All chassis component bolts using metal rubber bearings must always be tightened with the vehicle unloaded (empty).
- ◆ The metal-rubber bearings torsion is limited. Therefore, axle components with metal/rubber bearings must be placed in the corresponding operating position with the vehicle unloaded (empty) before tightening.
- ◆ Otherwise, the metal-rubber bearings would deform and their useful life consequently be reduced.



This position can be simulated on the lift with the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and the Support - T10149- .

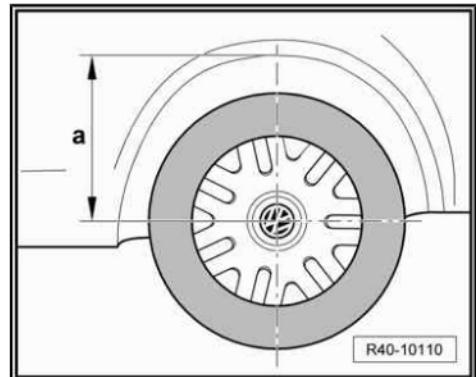
Before beginning work, use a measuring tape to measure the distance -a- from the centre of the wheel to the lower edge of the wheel arch.



**Note**

- ◆ *Measurement must be made with the vehicle unloaded.*
- ◆ *Write down the reading. This will be required for the subsequent tightening of bolts/nuts.*

Before raising the vehicle, fasten it to the lift's wishbones by using the Tension belt - T10038- ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle .



**Caution**

*If the vehicle is incorrectly secured, there is a risk it may fall off the lift!*

- Turn the wheel hub until the wheel bolt holes are positioned on top.
- Fasten the Support - T10149- to the wheel hub with the wheel bolt.

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Any necessary bolts and nuts may only be tightened when the distance -a- between the wheel hub and the lower corner of wheel arch is the same as previously measured.

Measurement -a- depends on the specific suspension installed:

Rear suspension 6)	Altitude -a- in mm
Conventional suspension (G01)	410 ± 10 mm
Conventional suspension (G01) (GP1)	413 ± 10 mm
Comfort suspension (G09, G16)	402 ± 10 mm
Comfort suspension (G14, G15)	390 ± 10 mm
Comfort suspension (G14) (GP1)	390 ± 10 mm
Conventional suspension (G23, G25)	402 ± 10 mm
Comfort suspension (G17)	413 ± 10 mm
Comfort suspension (G17, G28) (GP1)	413 ± 10 mm
Conventional suspension (G22) (GP1)	392 ± 10 mm
Comfort suspension (G10) (EU)	382 ± 10 mm
Conventional suspension (G26) (EU)	382 ± 10 mm
Comfort suspension (G18, G19) (GP1)	392 ± 10 mm
Conventional suspension (G18, G19, G27) (GP2)	388 ± 10 mm

6) The suspension installed in the vehicle's front axle is identified in the identification tag with the corresponding PR number. Explanations related to the PR numbers, refer to [⇒ page 206](#)

Procedure for lifting the front axle with vehicle unloaded, refer to [⇒ page 8](#).

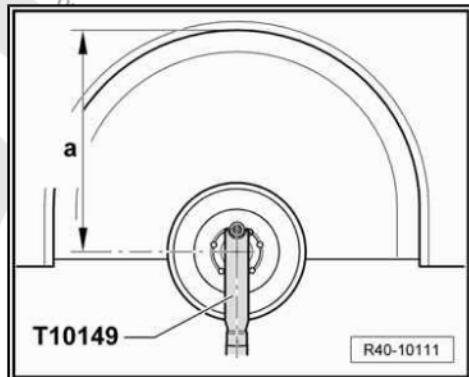
- Lift the rear axle using the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- until reaching measurement -a- .



#### WARNING

- ◆ *Do not lift or lower the vehicle if the Gearbox jack or combined engine/gearbox jack or EQ 7081 - VAG 1383A- is under the vehicle.*
- ◆ *Do not leave the Gearbox or engine/gearbox jack or EQ 7081 - VAG 1383A- under the vehicle for longer than necessary.*

- Tighten the union nuts and bolts.
- Remove the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- from underneath the vehicle.
- Remove the Support - T10149- .





## 1.4 Rear axle - remove and install

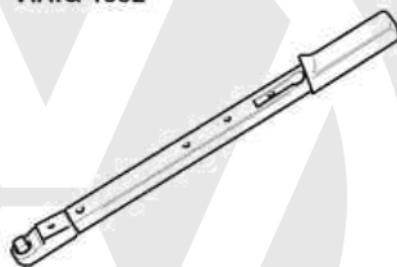


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ➤ page 204*

Special tools and workshop equipment required

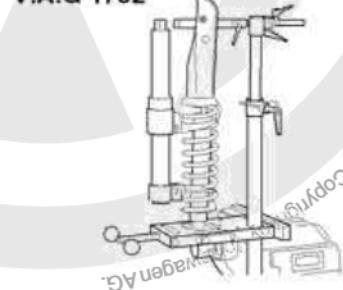
V.A.G 1332



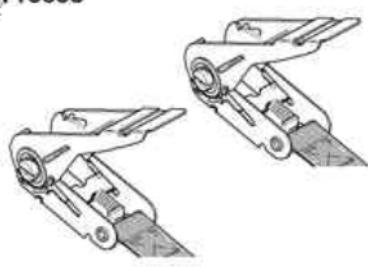
V.A.G 1383 A



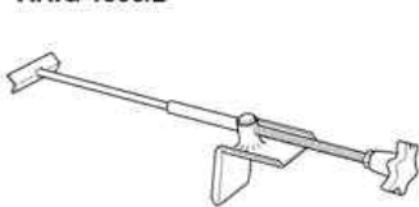
V.A.G 1752



T10038



V.A.G 1869/2



Q42-10022

- ◆ "Torque wrench - 40 to 200 Nm (fit. 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Tool for suspension struts - VAG 1752-
- ◆ Tensioning strap - T10038-
- ◆ Brake pedal pressing device - VAG 1869/2-



## 1.4.1 Removal



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Measure the distance from the wheel arch to the wheel centre [⇒ page 169](#) .
- Remove the centre console ⇒ Body - Internal assembly work; Rep. gr. 68 ; Internal equipment .
- Release the handbrake.
- Release the adjustment nut -arrow- so that the handbrake cables can be removed from the equalizer.
- Install the Brake pedal pressing device - VAG 1869/2- .

This way it is possible to prevent brake fluid from draining from the brake tubes and from the ABS hydraulic unit, when applicable!

- Lift the vehicle to working height ⇒ Maintenance ; Booklet .

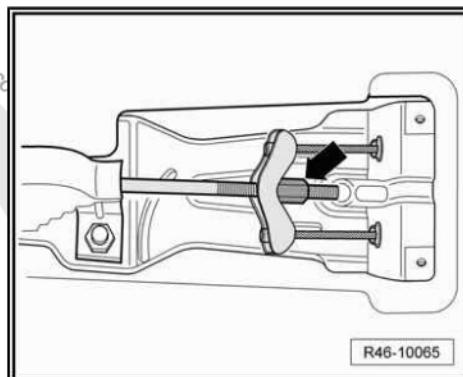
Fasten the vehicle to the lift

The vehicle must be fastened to the support arms of the lift before the rear axle is removed.



### Caution

*If the vehicle is not fastened to the lift, the vehicle may slide off the lift.*



R46-10065

- Remove the plugs from the body -3- and pass the Tension belt - T10038- through the holes.

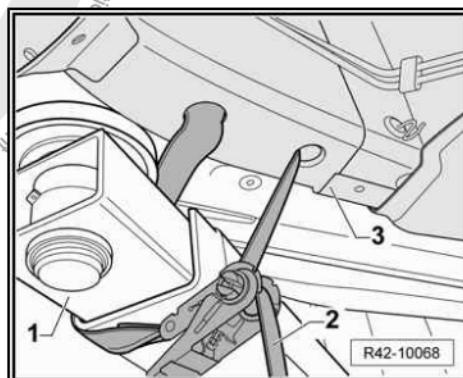
1 - Lift arm

2 - Tensioning belt - T10038-

- The vehicle must be fastened on the right and left sides with the fastening belts.

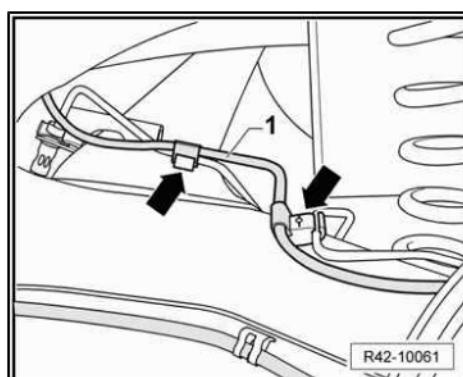
- Remove the wheels.

- Disconnect the connector from the speed sensor.



R42-10068

- Remove the cable -1- from the speed sensor by removing it from the clips -arrows-.



R42-10061



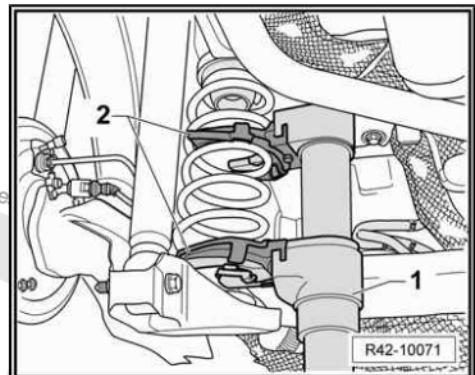
- Install the spring tensioning element -1-.

1 - Supercharger device or VW 5340 - VAG 1752/1-

2 - Spring seat - VAG 1752/3-

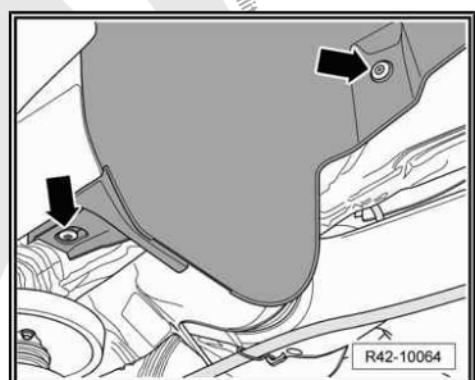
- Compress the coil spring until it can be removed.

– Remove the spring (left and right side).



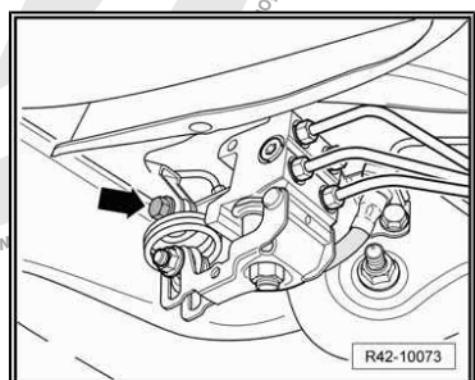
- Remove the wheel arch liner bolts -arrows- from both sides.

Vehicles without ABS:

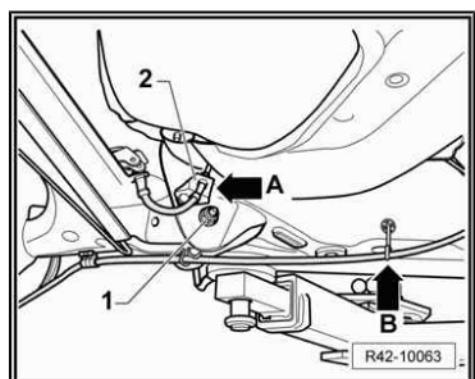


- Remove the screw -arrow-.

Continuation for all vehicles:

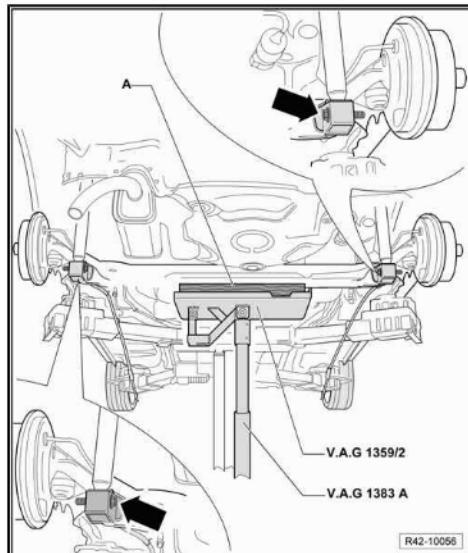


- Disconnect the brake pipes -arrow A- and remove the clip.
- Remove the left brake hose from the support -2-.
- Remove the right hose from the rear axle beam.
- Remove the handbrake cables from the support -arrow B-.
- Remove the guide pipes from the handbrake cables.
- Position the Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- .
- Fasten the rear axle with the belt or a similar device when lowering and removing.
- Remove the screws -1- from the rear axle beam.





- Loosen the rear axle from the shock absorbers -arrows-.
- Lower the rear axle with the help of the Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- .



## 1.4.2 Installation



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

Installation is performed in reverse to removal sequence, considering the following:

- Fasten the axle correctly and unloaded [⇒ page 168](#) .

The remaining installation steps are carried out in the reversal removal order, by observing the torques indicated [⇒ page 174](#)

- Adjust handbrake  $⇒$  Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Bleed the brake system  $⇒$  Brake system; Rep. gr. 47 ; Brakes - Hydraulic system, brake servo .
- Install the wheels and tighten the bolts [⇒ page 203](#) .

### Tightening torques

Components	Tightening torque
Lower bolt fastening shock absorber in rear axle ◆ Use new fastening screws ◆ Use new fastening nuts	40 Nm + 90°
Screws that fasten the axle beam supports to the vehicle's body 7) ◆ Use new fastening screws ◆ Use new fastening nuts	45 Nm + 90°

7) Tighten the bolts/nuts with vehicle unloaded [⇒ page 168](#)



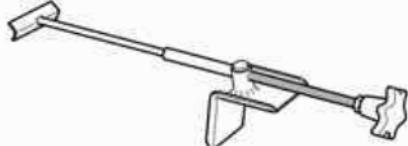
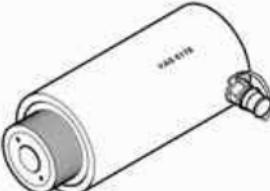
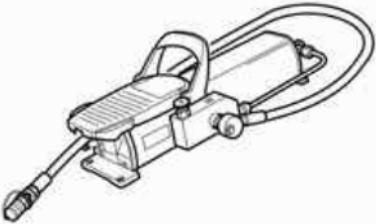
## 1.5 Metal-rubber bearing - remove and install



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

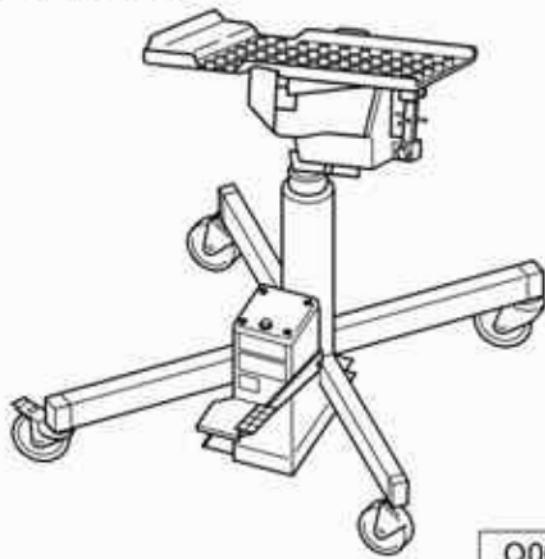
Special tools and workshop equipment required

	<b>3416/2</b>		<b>V.A.G. 1332</b>
	<b>V.A.G. 1869/2</b>		<b>VAS 6178</b>
	<b>VAS 6179</b>		<b>VAS 6180</b>

- ◆ Assembly tool - 3416/2-
- ◆ Brake pedal pressing device - VAG 1869/2-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Hydraulic pressure cylinder - VAS 6178-
- ◆ Hydraulic pump - VAS 6179-
- ◆ Assembly tool - VAS 6180-



## V.A.G 1383 A



- ◆ Gearbox or engine/gearbox set jack or EQ 7081/VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2

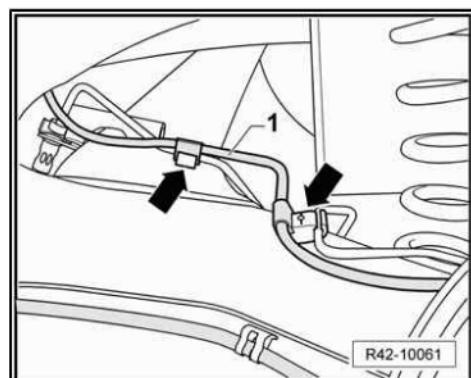
### 1.5.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

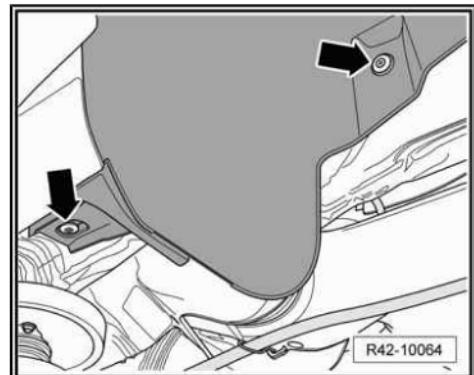
- Measure the distance from the wheel arch to the wheel centre [⇒ page 169](#) .
- Release the handbrake.
- Install the Brake pedal pressing device - VAG 1869/2- .
- Lift the vehicle to working height ⇒ Maintenance ; Booklet .
- Remove the wheels.
- Disconnect the connector from the speed sensor.
- Remove the speed sensor cable -1- from the clips -arrows-.





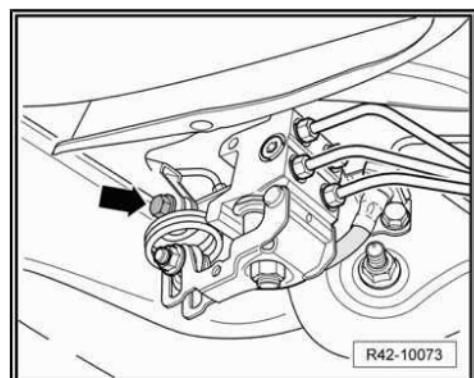
- Remove the screws from the wheel arch protectors -arrows- on both sides.

Vehicles without ABS:



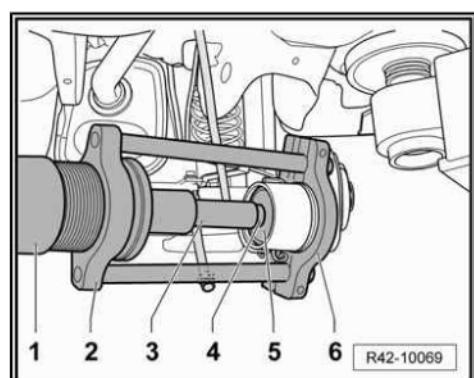
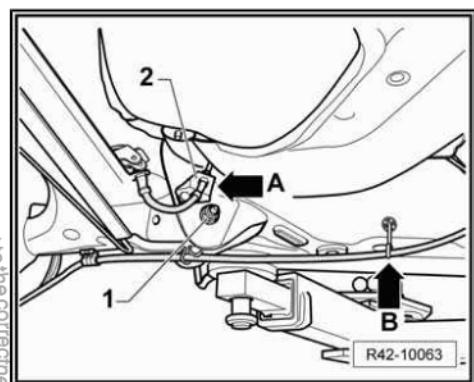
- Loosen the screw -arrow-.

Continuation for all vehicles



- Disconnect the brake pipes -arrow A- and remove the clip.
- Remove the left brake hose from the support -2-.
- Remove the right hose from the rear axle beam.
- Remove the handbrake cables from the support -arrow B-.
- Remove the handbrake cables from the guide tubes.
- Place Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- and Tray for EQ 7081 hydraulic jack - VAG 1359/2- in their positions under the rear axle.
- Remove the fastening screws/nuts from the rear axle beam -1-.
- Lower the rear axle with the Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2- .
- Remove the metal-rubber bearing.

1 - Hydraulic pump - VAS 6179-  
 2 - Assembly device - VAS 6180/1-  
 3 - Assembly device - VAS 6180/4-  
 4 - Assembly device - VAS 6180/3-  
 5 - Assembly Device - 3416/2-  
 6 - Assembly device - VAS 6180/2-



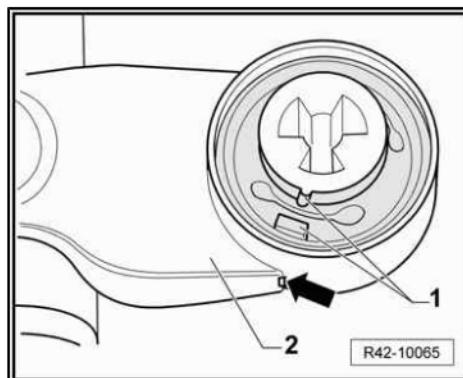


## 1.5.2 Installation

The metal-rubber bearing has marks -1- on the front face.

These marks must align with the edge -arrow- of the wishbone -2-.

- Identify the position of marks -1- on the cylindrical surface of the rubber-metal bearing.



- Install the metal-rubber bearing and the special tools on the rear axle.

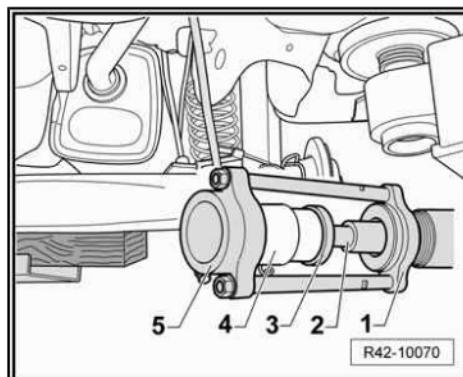
1 - Assembly device - VAS 6180/1-

2 - Assembly device - VAS 6180/6-

3 - Assembly device - VAS 6180/7-

4 - Bonded rubber bush

5 - Assembly device - VAS 6180/8-



- Before installing the metal-rubber bearing, make sure that your mark -arrow A- aligns with the edge of the wishbone -arrow B-.

- Install the metal-rubber bearing.

- Check the position of the metal-rubber bearing after the installation.

- Fasten the axle correctly and unloaded [⇒ page 168](#).

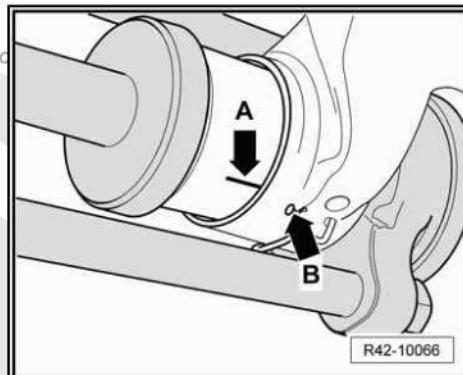
The remaining installation steps are carried out in the reversal removal order, by observing the torques indicated [⇒ page 178](#)

- Adjust handbrake  $\Rightarrow$  Brake system; Rep. gr. 46 ; Brakes - Mechanical systems .
- Bleed the brake system  $\Rightarrow$  Brake system; Rep. gr. 47 ; Brakes - Hydraulic system, brake servo .

### Tightening torques

Components	Tightening torque
Lower bolt fastening shock absorber in rear axle <ul style="list-style-type: none"> <li>◆ Use new fastening screws</li> <li>◆ Use new fastening nuts</li> </ul>	40 Nm + 90°
Screws that fasten the axle beam supports to the vehicle's body 8) <ul style="list-style-type: none"> <li>◆ Use new fastening screws</li> <li>◆ Use new fastening nuts</li> </ul>	45 Nm + 90°

8) Tighten the bolts/nuts with vehicle unloaded [⇒ page 168](#)





## 1.6 Spring - remove and install

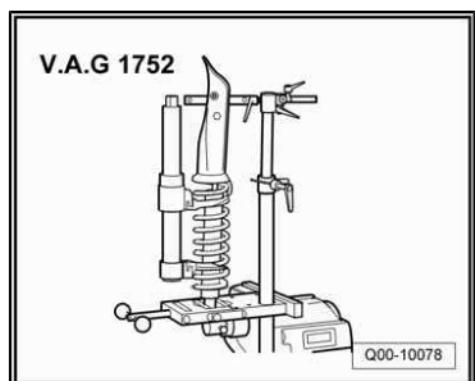


### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

Special tools and workshop equipment required

- ◆ Tool for suspension struts - VAG 1752-



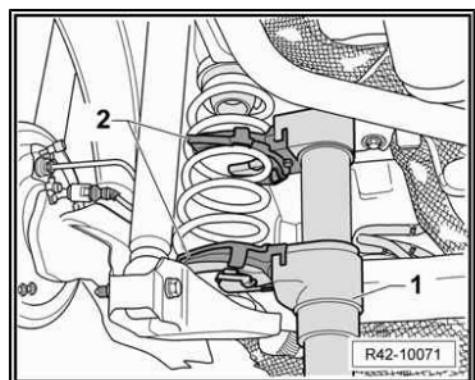
### 1.6.1 Removal



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Insert the spring tensioner -1-.
- 1 - Supercharger device or VW 5340 - VAG 1752/1-
- 2 - Spring seat - VAG 1752/3-
- Compress the coil spring until it can be removed.
- Remove the spring.



### 1.6.2 Installation



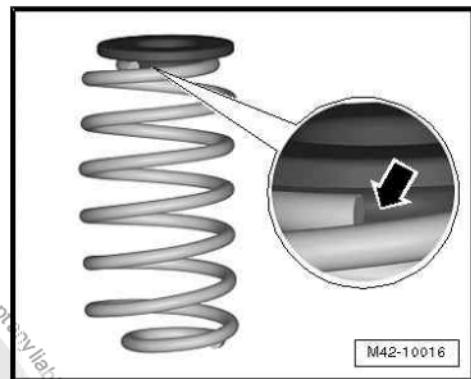
### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Make sure that the lower spring plate is not damaged. Replace, if necessary.
- Install the spring along with the spring seat plate.



- The end of the spiral must touch the upper stop -arrow-.
- Release the spring and remove the Compression device or VW 5340 - VAG 1752/1- (do not damage the spring surface protection).



M42-10016

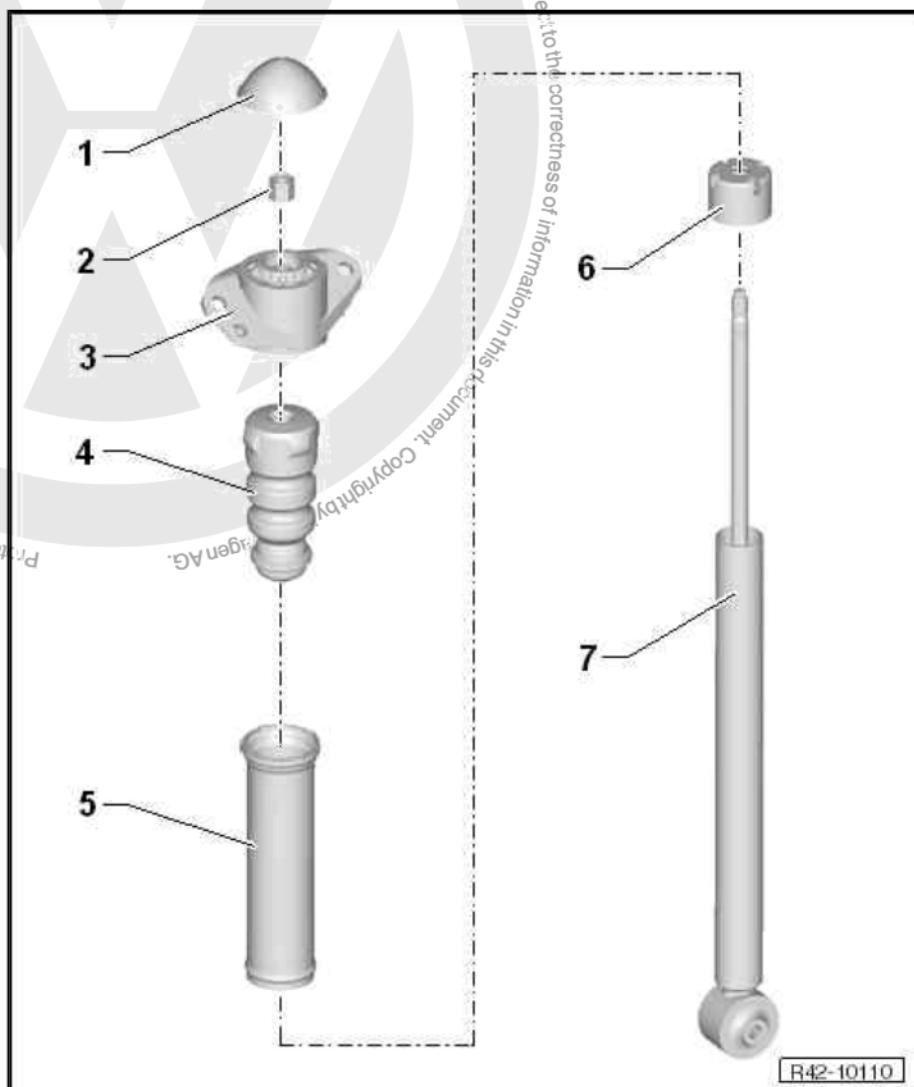
## 1.7 Shock absorbers - assembly overview

- 1 - Cover
- 2 - Hexagonal nut
  - Self-locking
  - 25 Nm
  - Replace once removed
  - Remove [⇒ page 181](#)
- 3 - Shock absorber support
- 4 - Striker
- 5 - Shock absorber boot
- 6 - Protective cap
- 7 - Shock absorber
  - See: ⇒ Electronic Parts Catalogue



### WARNING

Only shock absorbers of the same brand "Supplier" can be mounted in the same vehicle.



R42-10110

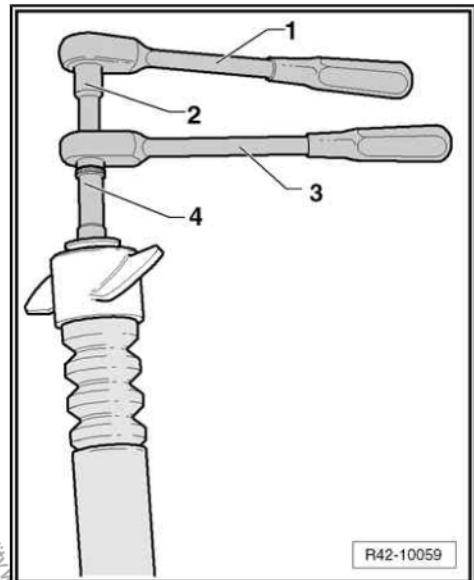
### Check the operation

- Compress the shock absorber manually. When doing so, the shock absorber rod must travel its complete length smoothly and with the same force
- When the shock absorber has sufficient gas pressure, the rod returns to its original starting position
- If the shock absorber rod does not return to its starting position and there is no oil leakage, then the shock absorber may still be in working order



Remove hexagonal nut from shock absorber

- 1 - Commercially available ratchet
- 2 - Wrench set - T10001/9-
- 3 - Wrench set - T10001/11-
- 4 - Wrench set - T10001/1-



R42-10059

## 1.8 Shock absorber - remove and install



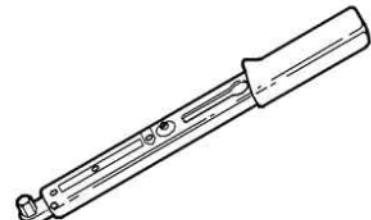
### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

Special tools and workshop equipment required

- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-

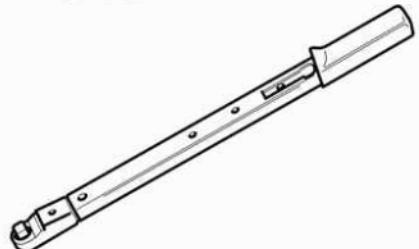
**V.A.G 1331**



Q00-10065

- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-

**V.A.G 1332**



Q00-10074



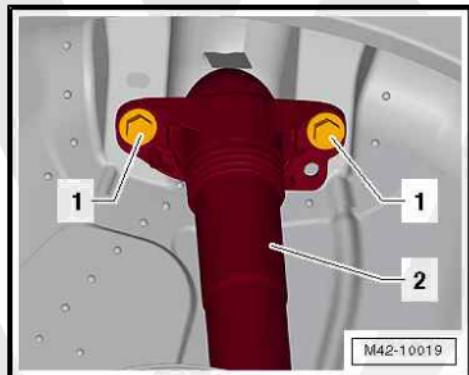
## 1.8.1 Removal



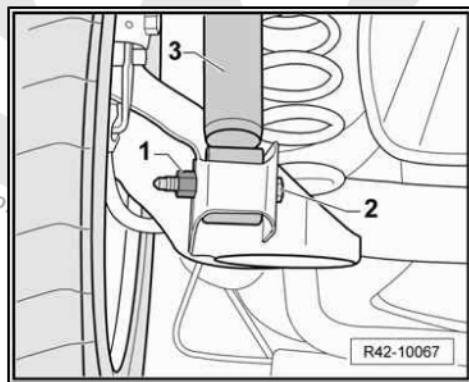
### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Lift the vehicle up to working height.
- Remove the securing bolts -1- from shock absorber -2-.



- Loosen nut -1- and hexagonal head bolt -2- in the rear axle's shock absorber -3-.
- Remove the shock absorber.



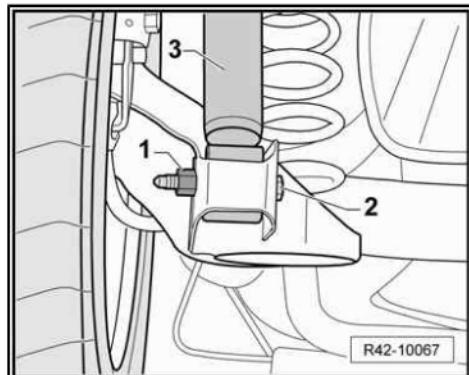
## 1.8.2 Installation



### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

- Install the shock absorber.
- Fasten the shock absorber -3- with the new hex head screw -2- and new fastening nut -1- to the rear axle.





#### Rear axle/shock absorber installation angle

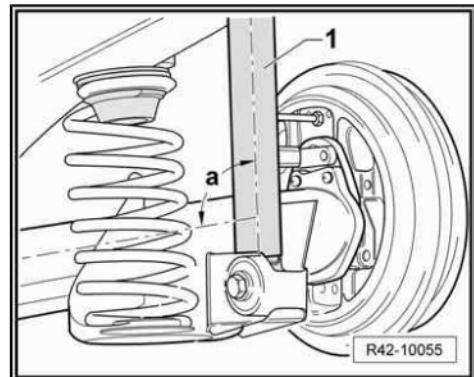
1 - Shock absorber

a - approx.  $96.75^\circ \pm 2^\circ$



Note

*Observe the assembly angle -a- of shock absorber to the centre of the suspension arm (rear axle) when fastening the shock absorber assembly to the rear shaft assembly*



Component	Tightening torques
Shock absorber to the vehicle body	30 Nm + 90°
◆ Use new fastening screws	
Shock absorber to rear axle	40 Nm + 90°
◆ Use new fastening bolts/nuts	





## 2 Wheel bearings for drum brakes (without adjustment) - repair



### WARNING

Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)

Replace self-locking nuts and bolts subject to angular torque.

### 2.1 Wheel roller bearings (without adjustment) - assembly overview

1 - Axle beam

2 - Rear brake plate with brake shoes

- Repair ⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems

3 - Hexagonal bolt

- 30 Nm + 90°
- Replace once removed

4 - Axle end

- Straightening operations are not permitted!
- Recutting the thread is not permitted!
- Remove and install [⇒ page 187](#)

5 - Wheel hub with roller bearing

- The ABS sensor ring is installed in the wheel hub
- Remove and install [⇒ page 185](#)

The wheel roller bearing and the wheel hub are installed together in a housing

This wheel roller bearing/hub set is maintenance- and clearance-free. Adjustment and repair works are not possible!

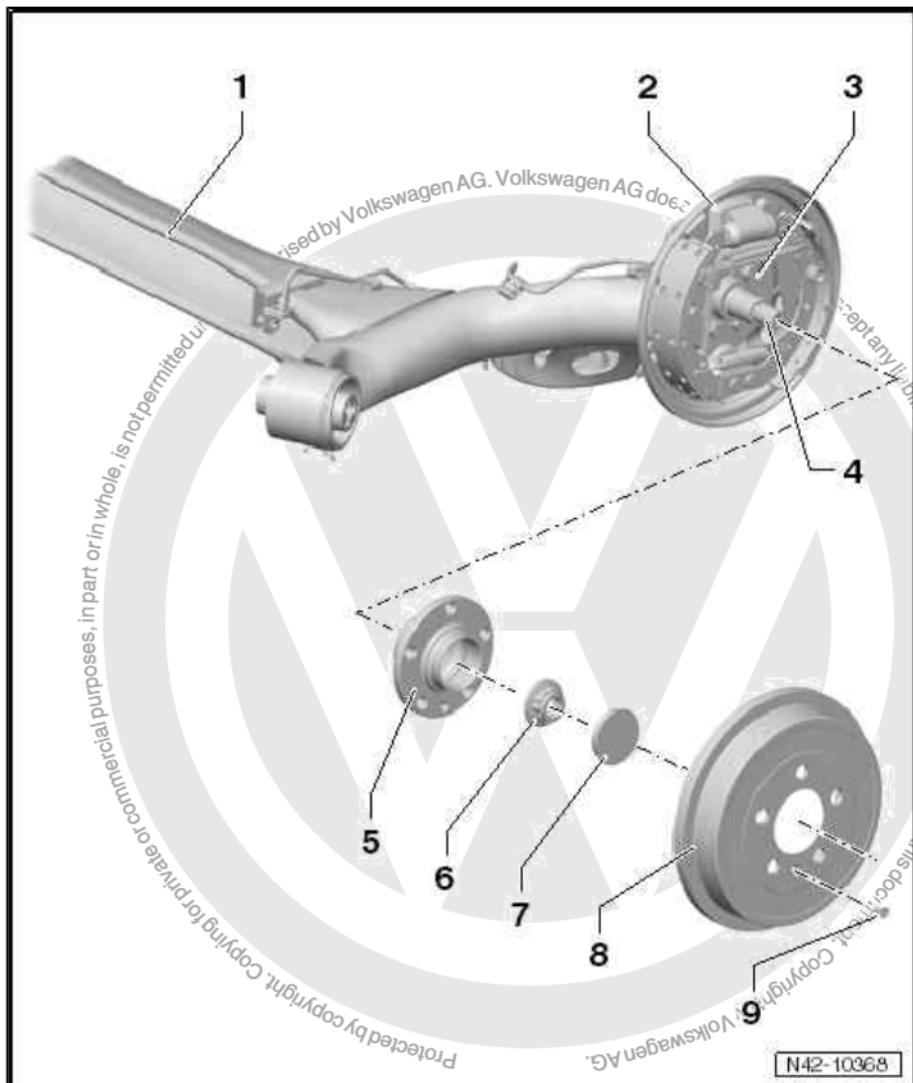
6 - Grooved nut (dodecahedron)

- Self-locking
- 70 Nm + 30°
- Replace once removed

7 - Dust protection cover

- Replace once removed
- Remove and install [⇒ page 185](#)

A perfect seal is only achieved by using a new dust protection cover.





Only then can the optimal working and high durability of the wheel bearing be guaranteed

8 - Brake drum

- Remove and install ⇒ Brake systems; Rep. gr. 46 ; Brakes - Mechanical systems

9 - Screw

- 4 Nm

## 2.2 Wheel hub/wheel bearing unit - remove and install

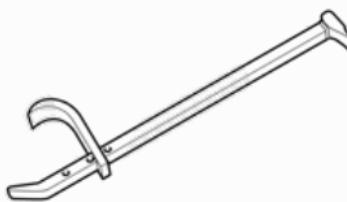


### WARNING

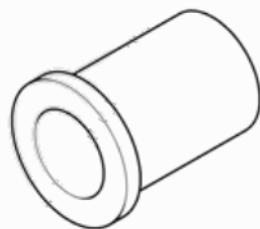
*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

Special tools and workshop equipment required

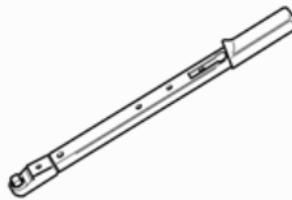
VW 637/2



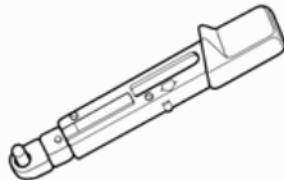
3241/4



V.A.G. 1332



V.A.G. 1410



Q42-10014

- ◆ Hub nut protector extractor - VW 637/2-
- ◆ Fitting sleeve - 3241/4-



- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Torque wrench - 4 to 20 Nm (fit. 3/8") - VAG 1410-

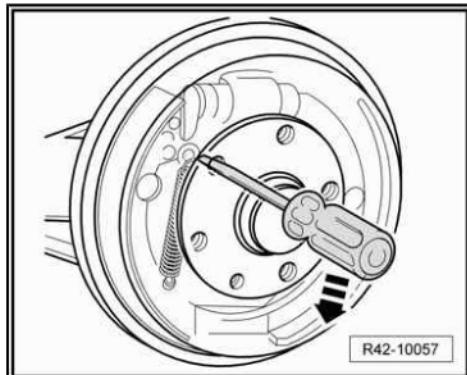
## 2.2.1 Removal



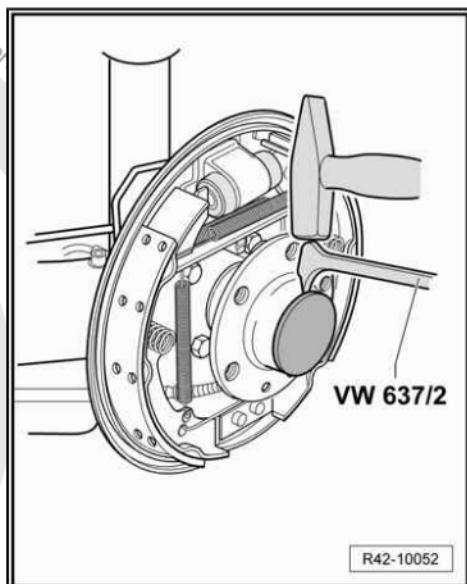
### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

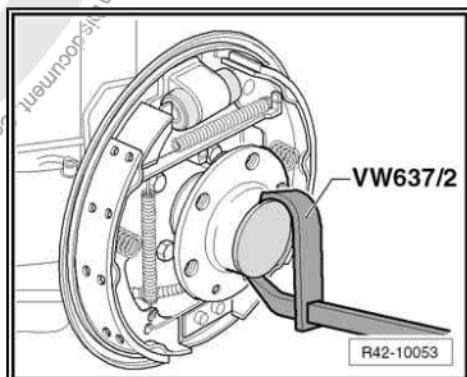
- Lift the vehicle up to working height.
- Remove the rear wheel.
- Retract the brake.
- Insert a screwdriver through the hole in the brake drum and press the adjustment wedge upwards.
- Remove the fastening screw from the brake drum and remove the brake drum.



- Remove the dust protection cover from the fitting by tapping lightly on the punch claw with the Hub nut protector extractor - VW 637/2- .



- Remove the protection cover.
- Remove the grooved nut (dodecahedron).
- Remove the wheel hub/wheel roller bearing unit from the shaft tip.





## 2.2.2 Installation



### WARNING

Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)

- Install the wheel hub/wheel roller bearing set carefully onto the shaft tip.

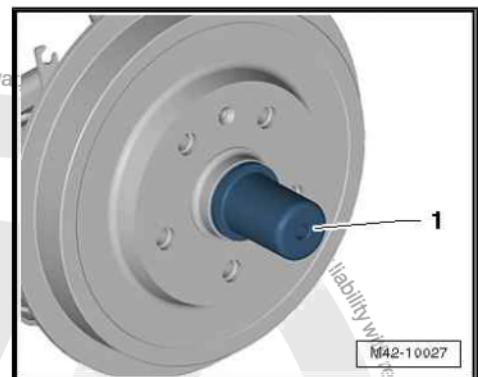
Ensure that the wheel hub/wheel bearing unit does not tilt.

- Install a new grooved nut and tighten it [⇒ Item 6 \(page 184\)](#) .
- Install the dust protection cover, using the Fitting sleeve - 3241/4- -1-.



### Note

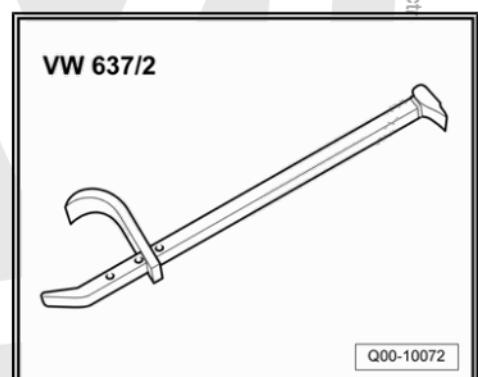
- ◆ Always replace the dust protection covers
- ◆ Damaged dust protection covers allow humidity to enter, therefore always use the recommended tool
- Install the wheel and tighten the screws [⇒ page 203](#) .



## 2.3 Shaft end for wheel roller bearings (without adjustment) - remove and install

Special tools and workshop equipment required

- ◆ Hub nut protector extractor - VW 637/2-



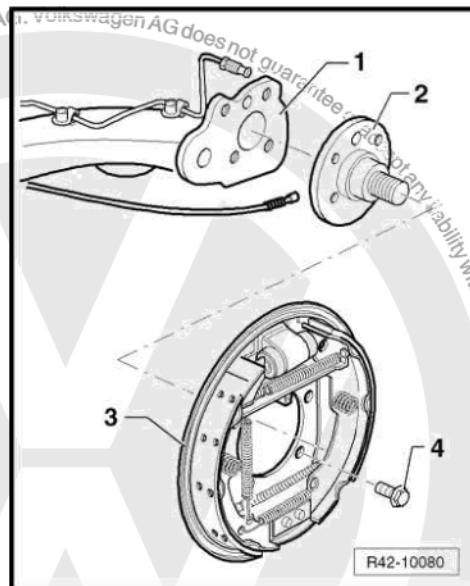
- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-





### 2.3.1 Removal

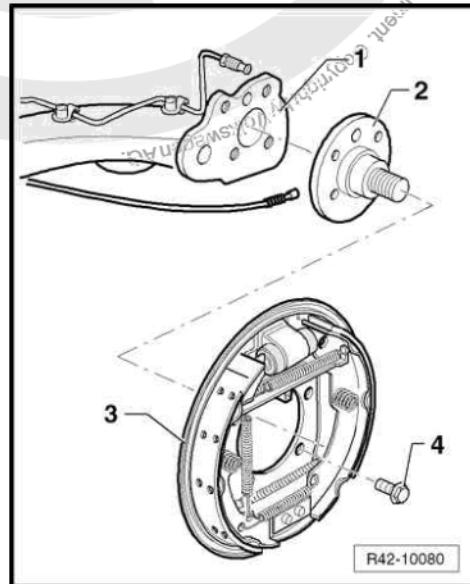
- Remove the rear wheel.
- Remove the wheel hub protection.
- Remove the brake drum.
- Remove wheel hub with roller bearing [⇒ page 185](#) .
- Release the handbrake cable from handbrake lever ⇒ Brake systems ; Rep. gr. 46 ; Brakes - Mechanical systems .
- Remove the rear axle speed sensor ⇒ Brake system; Rep. gr. 45 ; Anti-lock system (ABS) (vehicles with ABS only).
- Remove the securing bolts -4- (4 units) from shaft end -2- and from the calliper body with brake shoes -3-.
- Remove the shaft end -2-.
- Fasten the brake calliper body with shoes to the body (e.g., with a wire).



### 2.3.2 Installation

Installation is executed in reverse sequence of removal, observing the following:

- Install the shaft end -2- to the rear axle beam -1-.
- Tighten the securing bolts -4- to shaft end and calliper body with brake shoes -3-. Tightening torque, see [⇒ Item 3 \(page 184\)](#) .
- Install the handbrake cable to handbrake lever ⇒ Brake systems ; Rep. gr. 46 ; Brakes - Mechanical systems .
- Install wheel hub with roller bearing [⇒ page 185](#) .
- Install the rear wheel.
- Tighten wheel securing bolts. Tightening torque, see [⇒ page 203](#) .



### 2.4 Shaft end - check

- Remove the shaft end [⇒ page 187](#) .
- Fasten the shaft end to the vise with aluminium jaws.



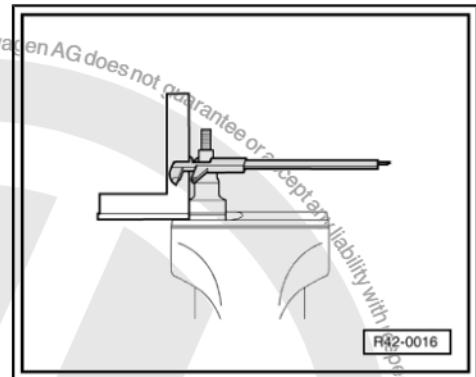
- With a square and vernier calliper, measure the shaft end in three different points.



Note

*If the difference of values exceeds 0.25 mm, replace the shaft end.*

- Install the shaft end [⇒ page 187](#).





### 3      Wheel bearings for drum brakes (with adjustment) - repair



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

*Replace self-locking nuts and bolts subject to angular torque.*

#### 3.1    Wheel roller bearings (with adjustment) - assembly overview



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*

1 - Axle beam

- different versions
- See: [⇒ Electronic Parts Catalogue "ETKA"](#)

2 - Calliper body with brake shoes

- Repair [⇒ Brake system; Rep. gr. 46 ; Brakes - Mechanical systems](#)

3 - Hexagon socket head bolt

- 30 Nm + 90°
- Replace once removed

4 - Axle end

- Straightening operations are not permitted
- Recutting the thread is not permitted

5 - Thrust washer

6 - Hexagonal nut

- Adjust [⇒ page 191](#)

7 - Sprocket

8 - Wheel hub protection

- Replace once removed

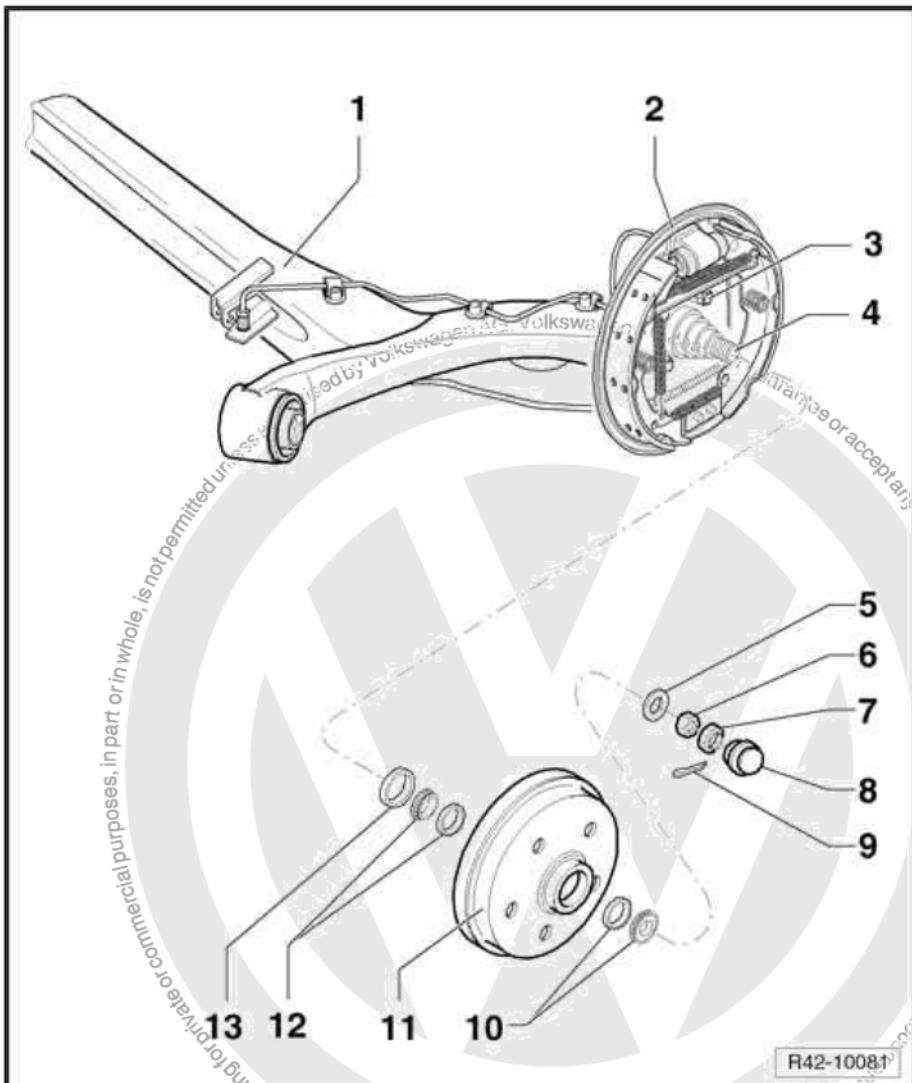
9 - Cotter pin

- Replace once removed

10 - Rear wheel external roller bearing

- Adjust [⇒ page 191](#)

- Remove and install [⇒ page 194](#)





11 - Brake drum

Remove and install ⇒ Brake systems; Rep. gr. 46 ; Brakes - Mechanical systems

12 - Rear wheel internal roller bearing

Adjust ⇒ [page 191](#)  
 Remove and install ⇒ [page 194](#)

13 - Rear wheel internal roller bearing seal

Remove and install ⇒ [page 198](#)

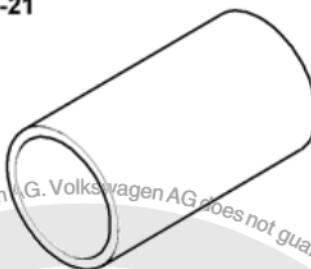
### 3.2 Rear wheel roller bearing - check and adjust clearance



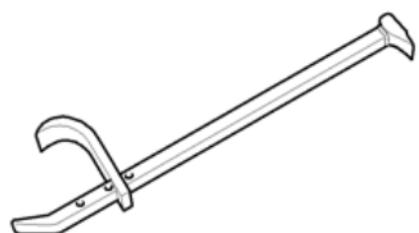
#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

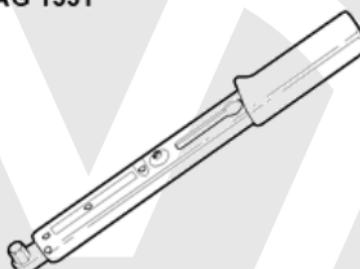
40-21



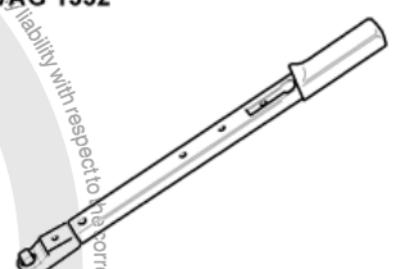
VW 637/2



VAG 1331



VAG 1332



Q42-10018

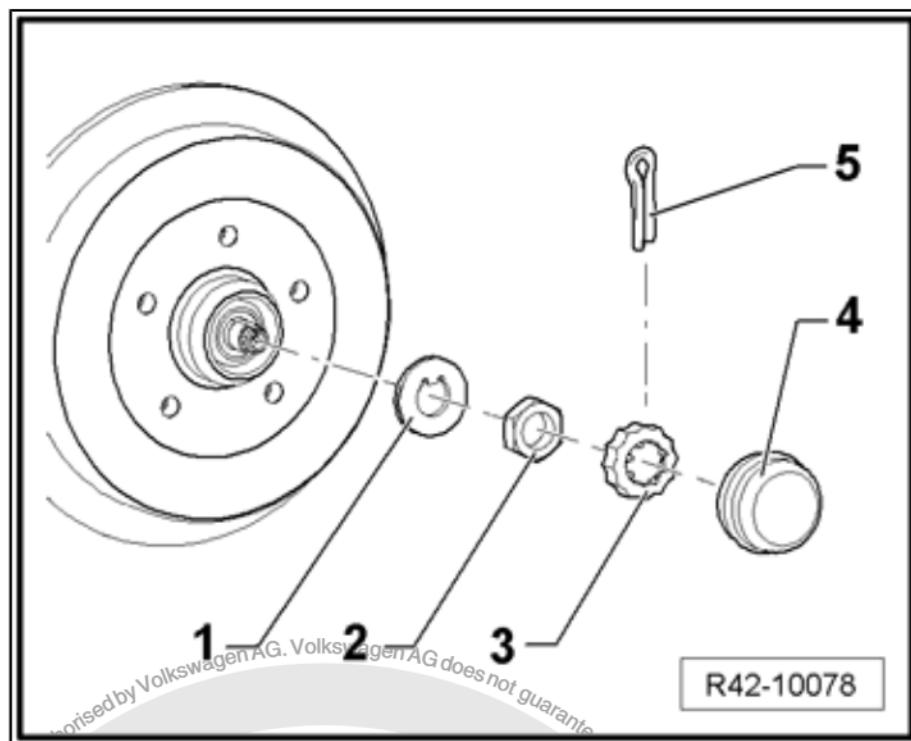
◆ Support tube - 40-21-



- ◆ Hub nut protector extractor - VW 637/2-
- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-

Rear wheel hub - general overview of assembly:

- 1 - Thrust washer
- 2 - Hexagonal nut
- 3 - Sprocket
- 4 - Wheel hub protection
  - Replace once removed
- 5 - Cotter pin
  - Replace once removed



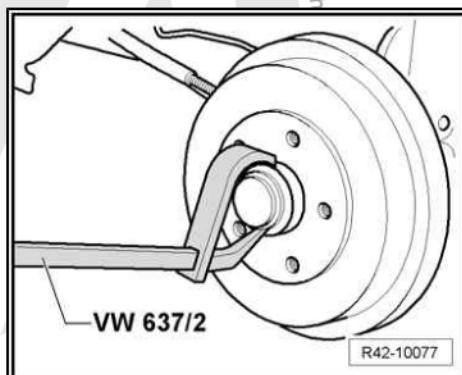
Adjust the roller bearing clearance:



Note

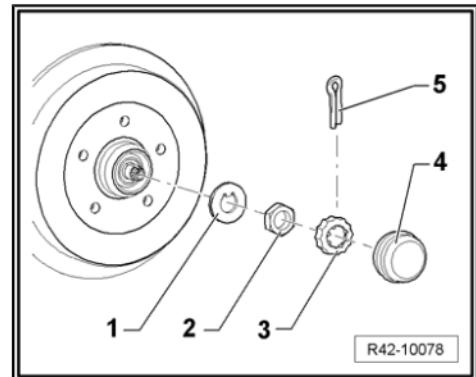
*Removal of the wheel is only necessary for vehicles with light-alloy rims.*

- Remove the wheel hub protector -4- with the Hub nut protector puller - VW 637/2- .

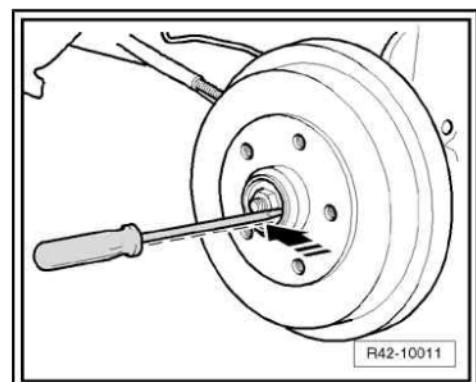




1. Remove the cotter pin -5- and the sprocket -3-.



1. Place a screwdriver between the washer and the brake drum hub so the screwdriver is perpendicular to the washer.
2. Move the washer in the radial direction with a light pressure of the forefinger-arrow- applied to the end of the screwdriver.





1. Never turn -arrows- or leverage the screwdriver.



Note

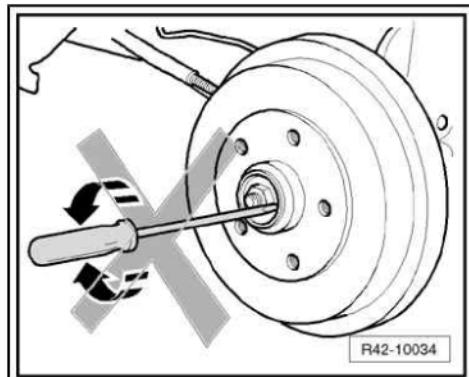
*The play adjustment is correct when it is possible to displace the thrust washer in only the radial direction and, when moving the brake drum in the axial direction, it does not have an apparent play.*

2. If the washer does not move, it is necessary to adjust the roller bearing clearance [⇒ page 194](#).



**WARNING**

- ◆ The screwdriver should touch only the washer and never the outer roller bearing of the wheel.
- ◆ Never rotate or leverage with the screwdriver, assuring that the screwdriver does not touch the brake drum hub on no account.
- ◆ If the notes above are not strictly followed, the adjustment of bearing end play will be jeopardized (it can lead to noises and breakage of bearings).



**Adjust bearing clearance.**

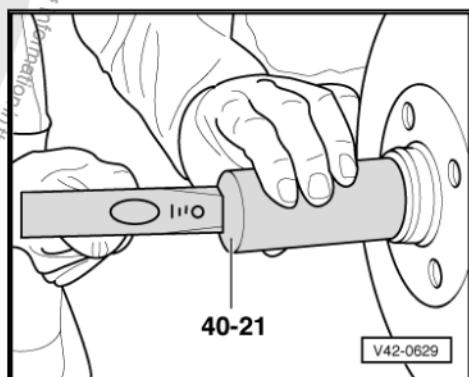
- Loosen or tighten the hexagonal nut, relieving or increasing the pressure on the thrust washer and, simultaneously, check its movement in the radial direction, according to the procedure described above [⇒ page 192](#).
- Check the roller bearing clearance adjustment again. If necessary, repeat the procedure until the adjustment is correct [⇒ page 192](#).
- Install the sprocket.
- Install the new cotter pin.
- Install the new wheel hub protector with the Support tube - 40-21-.



Note

*The wheel hub cover must be replaced whenever removed*

- Install and tighten wheel securing bolts. Tightening torque, see [⇒ page 203](#)



### 3.3 Internal/external rear wheel roller bearing - remove and install

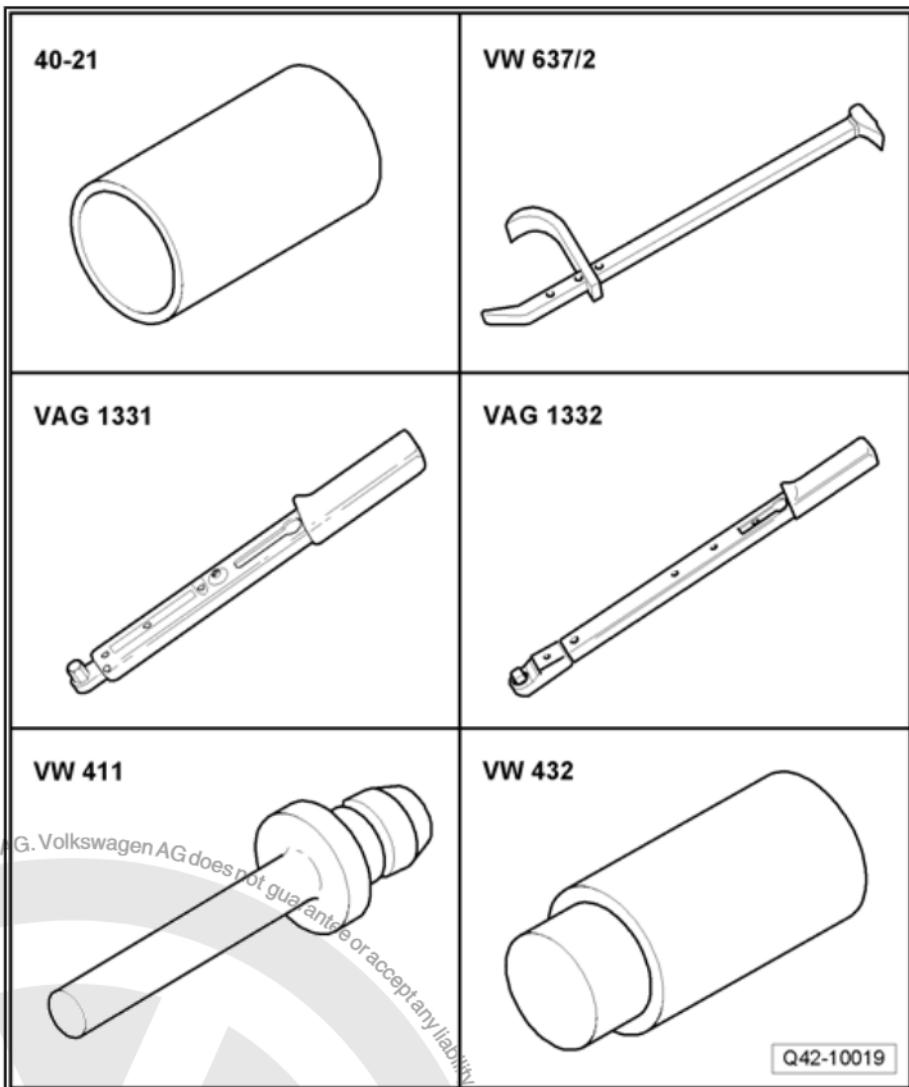


**WARNING**

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [⇒ page 204](#)*



Special tools and workshop equipment required

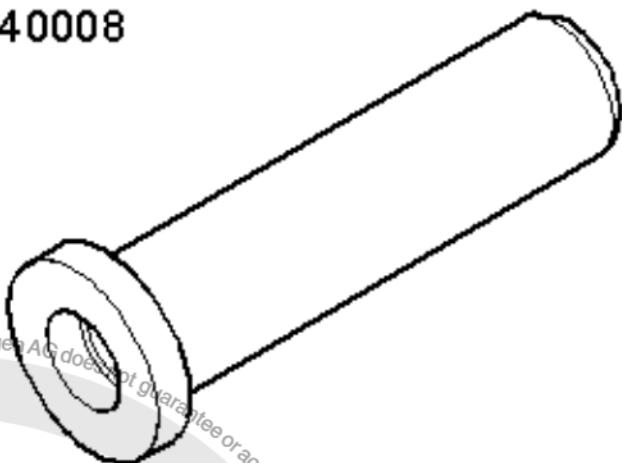


- ◆ Support tube - 40-21-
- ◆ Hub nut protector extractor - VW 637/2-
- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Press tool - VW 411-
- ◆ Thrust piece - VW 432-

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 With respect to the correctness of information in this document.



**T40008**



W00-1002

♦ Press tube - T40008-

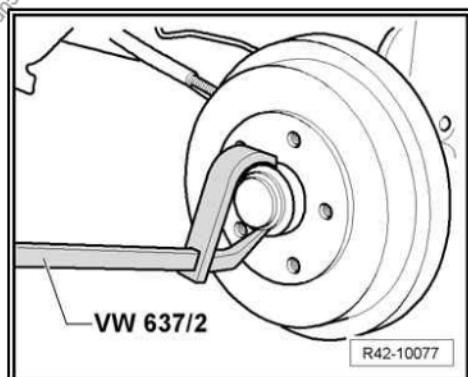
### 3.3.1 Removal



#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. [≥ page 204](#)*

- Remove the rear wheel.
- Remove the wheel hub protector, with the Hub nut protector puller - VW 637/2- .

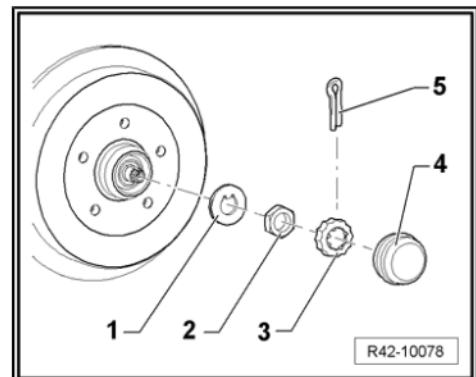


VW 637/2

R42-10077



- Remove the cotter pin -5- and the sprocket -3-.
- Remove the brake drum.
- Remove the roller bearing seal.
- Remove the internal and external roller bearing external tracks with a hammer and a drift pin.



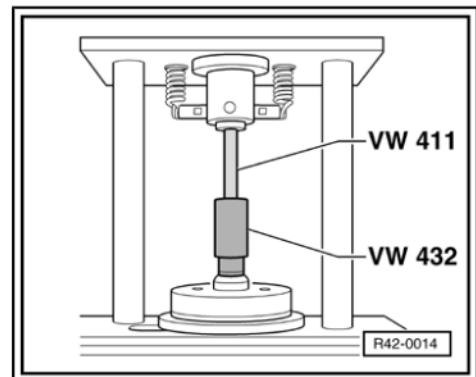
### 3.3.2 Installation



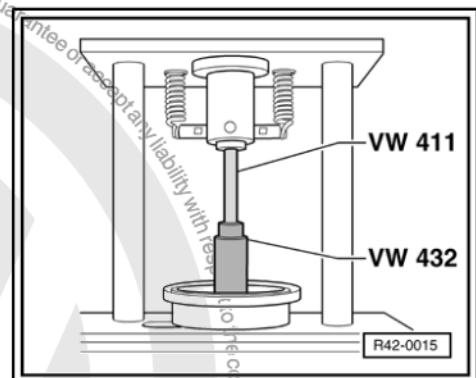
#### WARNING

*Before performing any repairs to the vehicle's suspension system, read chapter "miscellaneous" and check whether posterior alignment of the vehicle will be required. ⇒ [page 204](#)*

- Install the external track of the external roller bearing.

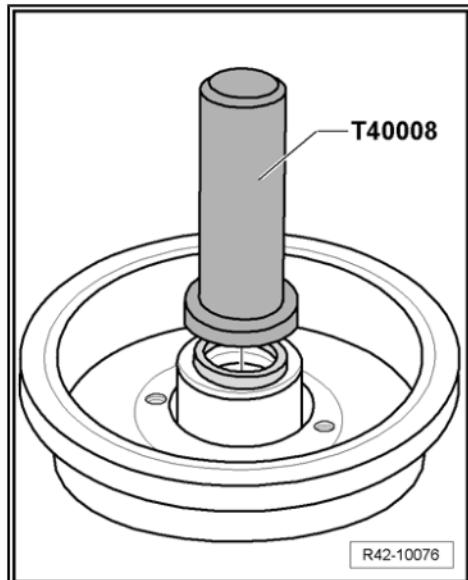


- Install the external track of the internal roller bearing.
- Fill the wheel hub and the external roller bearing tracks with approximately 17g. of Multi-purpose grease . Refer to the ⇒ Chemicals Manual .
- Fill the internal roller bearing with approximately 6g. of Multi-purpose grease . Refer to the ⇒ Chemicals Manual .
- Install the internal roller bearing.

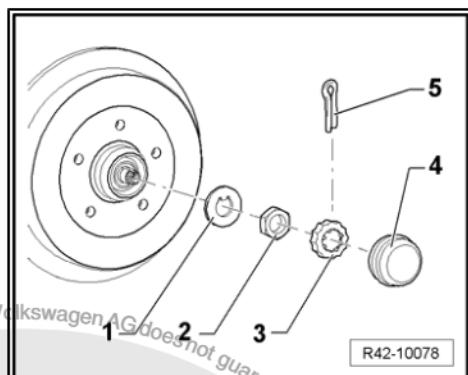




- Install a new seal on the rear wheel using the Pressure tube - T40008- .
- Fill the external roller bearing with approximately 4g. of Multi-purpose grease . Refer to the → Chemicals Manual .
- Install external roller bearing.
- Install the brake drum.



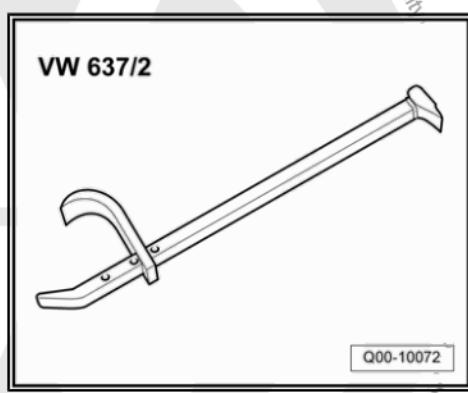
- Install a washer -1- and hexagonal nut -2-.
- Tighten the hexagonal nut -2- to a torque of 30 Nm, slowly turning the brake drum with your hand.
- Slightly loosen the hexagonal nut -2- and adjust the wheel bearing clearances [⇒ page 191](#) .
- Install the rear wheel.
- Tighten wheel securing bolts. Tightening torque [⇒ page 203](#) .



### 3.4 Rear wheel inner roller bearing seal - remove and install

Special tools and workshop equipment required

- ◆ Hub nut protector extractor - VW 637/2-

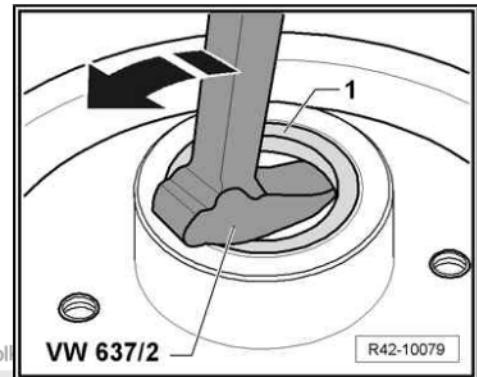


#### 3.4.1 Removal

- Remove the rear wheel.
- Remove the wheel hub protection.
- Remove the cotter pin, sprocket and nut.
- Remove the brake drum, along with the guard plate and the external roller bearing roller spacer.

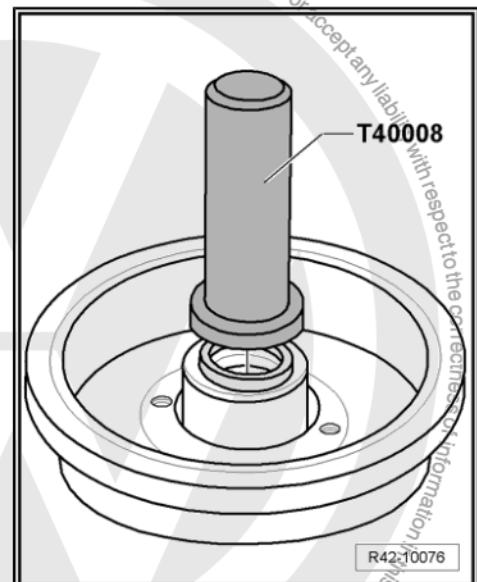


- Remove the seal -1- from inner wheel roller bearing with the Hub nut guard puller - VW 637/2- .

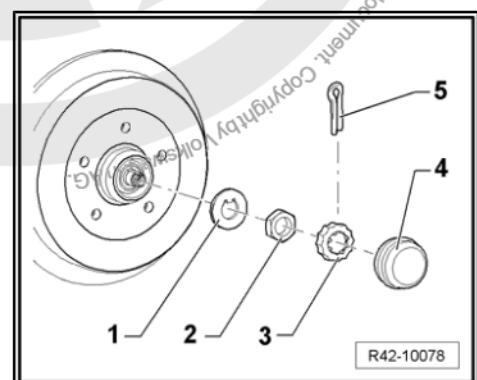


### 3.4.2 Installation

- Install a new seal on the rear wheel using the Pressure tube - T40008- .
- Install the brake drum.



- Install a washer -1- and hexagonal nut -2- .
- Tighten the hexagonal nut -2- to a torque of 30 Nm, slowly turning the brake drum with your hand.
- Slightly loosen the hexagonal nut -2- and adjust the wheel bearing clearances [⇒ page 191](#) .
- Install the rear wheel.
- Tighten wheel securing bolts. Tightening torque [⇒ page 203](#) .

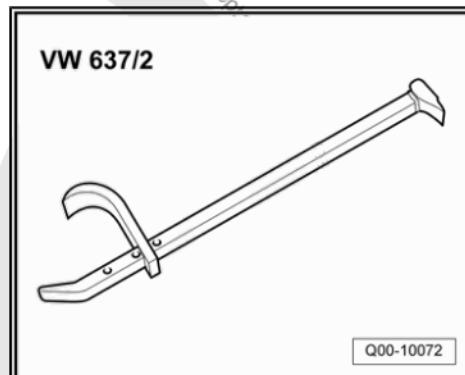


## 3.5 Shaft end for wheel roller bearings (with adjustment) - remove and install

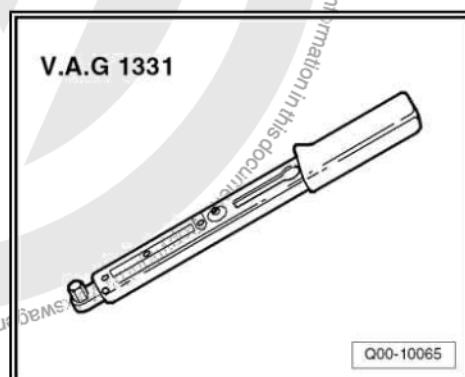
Special tools and workshop equipment required



- ◆ Hub nut protector extractor - VW 637/2-

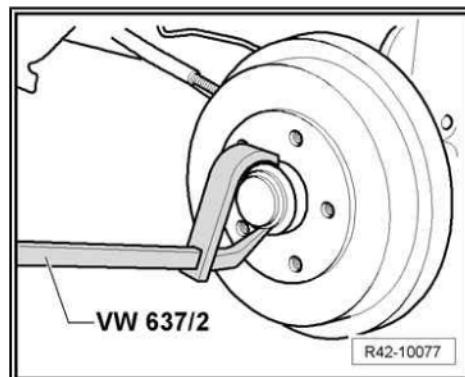


- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-

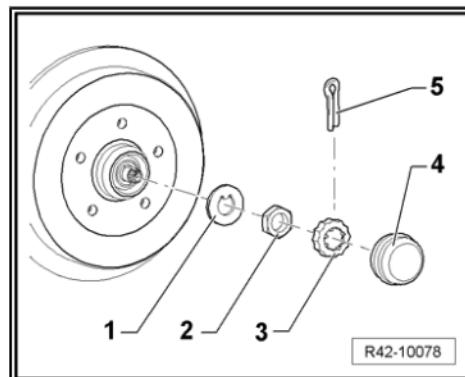


### 3.5.1 Removal

- Remove the rear wheel.
- Remove the wheel hub protector, with the Hub nut protector puller - VW 637/2- .

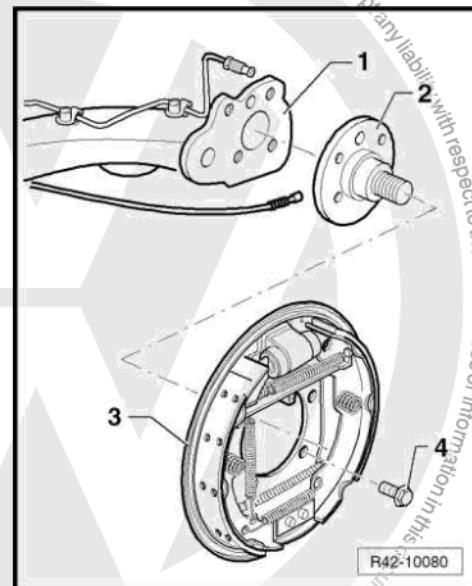


- Remove the cotter pin -5- and the sprocket -3-.
- Remove hex nut -2- and washer -1-.
- Remove the brake drum.
- Release the handbrake cable from handbrake lever ⇒ Brake systems ; Rep. gr. 46 ; Brakes - Mechanical systems .





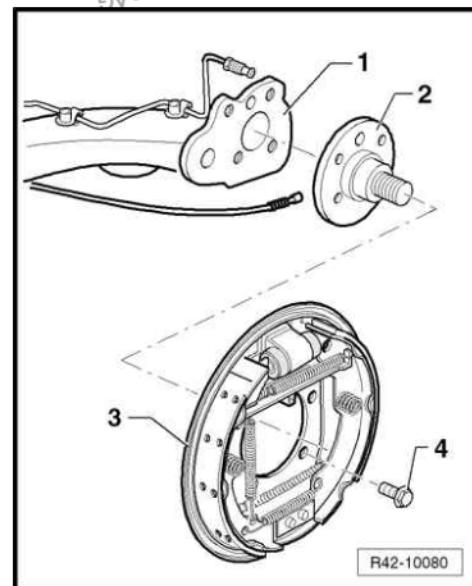
- Remove the securing bolts -4- (4 units) from shaft end -2- and from the calliper body with brake shoes -3-.
- Remove the shaft end -2-.
- Fasten the brake calliper body with shoes to the body (e.g., with a wire).



### 3.5.2 Installation

Installation is executed in reverse sequence of removal, observing the following:

- Install the shaft end -2- to the rear axle beam -1-.
- Tighten the securing bolts -4- to shaft end and calliper body with brake shoes -3-. Tightening torque, see [⇒ Item 3 \(page 190\)](#).
- Install the handbrake cable to handbrake lever ⇒ Brake systems ; Rep. gr. 46 ; Brakes - Mechanical systems .
- Adjust the roller bearing clearance [⇒ page 191](#) .
- Install the rear wheel.
- Tighten wheel securing bolts. Tightening torque, see [⇒ page 203](#) .



### 3.6 Shaft end - check

- Remove the shaft end [⇒ page 199](#) .
- Fasten the shaft end to the vise with aluminium jaws.

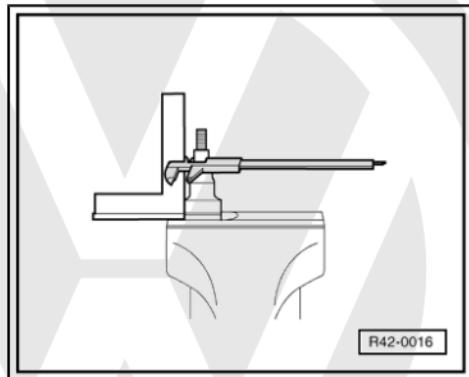


- With a square and vernier calliper, measure the shaft end in three different points.



*If the difference of values exceeds 0.25 mm, replace the shaft end.*

- Install the shaft end [⇒ page 199](#)





## 44 – Wheels, tyres, vehicle geometry

### 1 Wheel bolts

#### 1.1 Bolts with anti-theft lock

Vehicles with aluminium wheels may be equipped with anti-theft wheel fastening bolts.

The correct adapter socket is included in the vehicle tool kit, properly fitted in the spare wheel.

The requests for adapter sockets must be made using the part number Screw with Anti-theft Adapter Socket - 8D0 601 139 F- , followed by a 3-digit code.

To determine the 3-digit code, count the number of grooves in the screw safety standard and use the following table:

Number of grooves	3-digit code
10	000
11	001
13	002
14	003
15	004
16	005
17	006
19	007
20	008
21	009

Each adapter socket is shipped with one screw for the corresponding wheel.



#### Note

*The Socket set - T40004- is a full set of sockets for removing and installing the screws with this coding. It has the 10 combinations possible.*

#### 1.2 Wheel bolts - tightening torque

Wheel hub wheel bolt for all vehicles

120 Nm



## 2 Vehicle alignment



### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

### 2.1 Miscellaneous

The vehicle must only be measured with an alignment equipment recommended and approved by "VOLKSWAGEN".

We recommend measuring the front and rear axle geometry in each vehicle measurement.

Otherwise, the correct vehicle travelling behaviour will not be ensured!



#### Note

- ◆ It is recommended to only align the vehicle after 1000 to 2000 km, as the coil spring seating process is only concluded by then.
- ◆ When performing the adjustment, the values must be the closest as possible of the nominal specification.

Pay attention! The steering wheel and column have a mark.

A - Mark on the steering wheel

B - Mark on the steering column

This is the only way to ensure the steering rack will not be decentralized.

Vehicles with Electronic Stability Program "ESP".

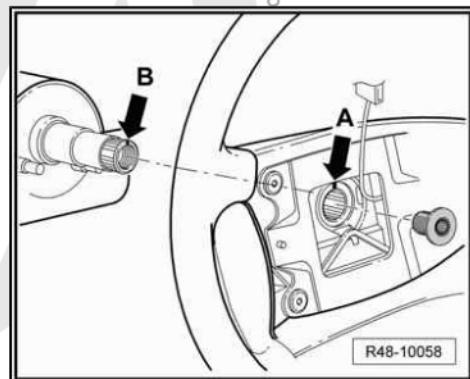
- If the steering wheel is moved in these vehicles, it is necessary to check the basic adjustment of the Steering angle sensor - G85- Perform the basic "adjustment on the Assisted Troubleshooting" with the Vehicle diagnostic, testing and information system - VAS 5052A- .

Steering columns supplied as replacement parts do not present a punch point.

After the vehicle alignment and the subsequent test drive, these steering columns must be marked.

It is necessary to align the vehicle when:

- ◆ the travelling behaviour is irregular
- ◆ parts are replaced after involvement in an accident
- ◆ irregular tire wearing
- ◆ shaft parts replaced



Replaced/removed front suspension components	Measurement required		Rear axle components replaced/removed		Measurement required	
	Yes	No			Yes	No
Wishbone	X		Shock absorber			X
Wheel roller bearing housing		X	Coil spring			X
Steering linkage bar terminal	X		Rear axle beam		X	
Steering box	X		Metal-rubber bearings		X	



Replaced/removed front suspension components	Measurement required		Rear axle components replaced/removed	Measurement required	
	Yes	No		Yes	No
Auxiliary frame (assembly mounting)	X		Wheel bearing		X
Suspension column	X				
Auxiliary frame console	X				
Anti-roll bar	X				
Shock absorber	X				
Wheel bearing		X			

## 2.2 Checking conditions:

- Check the suspension, wheel roller bearings, steering wheel and connecting rods of the steering wheel for excessive play and damages
- The tyre groove depth should not have a difference exceeding 2 mm on the same axle
- Tire filling pressure as prescribed
- Unloaded vehicle
- The fuel tank must be full.
- The spare wheel and tools are in their respective assembly positions in the vehicle
- The water reservoir for the windscreen/headlight washer system must be full.
- Make sure that the rotary plates and moving supports are not in the final stop (buffer) during the measurement.

### Pay attention!

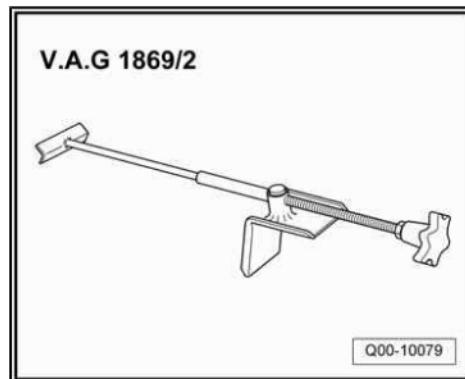
- The alignment machine must be properly assembled and adjusted to the vehicle; follow the equipment operation instructions manual.
- Request training from your aligner manufacturer, if necessary.
- The platform and the axle measurement machine/computer can, throughout time, deviate from the initial levelling/adjustment.
- The platform and the axle measurement machine/computer must be gauged and, if necessary, adjusted at least once a year.
- Handle these highly sensitive units carefully and conscientiously!

## 2.3 Preparation for measurement

### Special tools and workshop equipment required



- ◆ Brake pedal pressing device - VAG 1869/2-



The axial oscillation of the wheel rims must be compensated. Otherwise, the measurement result will be incorrect.

If the rim compensation is not performed, it will not be possible to perform a correct adjustment!

When you do this, follow the information from the aligner manufacturer.

- Carry out the rim compensation.
- Install the Brake pedal pressing device - VAG 1869/2-
- Press the brake pedal with the actuator.

## 2.4 Vehicle identification tag

Explanations related to the PR numbers in the vehicle identification tag

Different types of suspension are installed, depending on the engine and vehicle versions. Such suspensions are identified through the PR numbers.

The suspension installed in the vehicle's front axle is identified in the identification tag with the corresponding PR number.

### Example of a vehicle identification tag

In this example, the vehicle is equipped with standard G16 suspension -arrow-

The vehicle identification tag is located in the spare wheel compartment and in the Maintenance and Warranty booklet.

The PR numbers are decisive to match the nominal alignment values and the vehicle.

It is also possible to locate the PR through the ELSA/Individual recommendations about the vehicle.



### Example of how to locate the PR number through the ELSA

In this example, the vehicle is equipped with comfort suspension (G10) -arrow-.





## 2.5 Sequence for vehicle alignment

The following stages must be followed:

- 1 - Check the front axle camber and adjust it if necessary  
[⇒ page 210](#). If the values are out of tolerance, the tilting to one of the vehicle sides must be checked and, if necessary, compensated before performing the adjustment.  
[⇒ page 209](#).
- 2 - Check the rear axle camber [⇒ page 211](#). The camber is not adjustable. If the values are out of tolerance, the tilting to one of the vehicle sides must be checked and, if necessary, compensated [⇒ page 209](#). If the values then still deviate from the specification, the rear axle may be replaced, if necessary.
- 3 - Check the rear axle convergence [⇒ page 212](#). The convergence in the rear axle is not adjustable. If the values diverge from tolerance, tilting to one of the sides of vehicle must be checked and, if necessary, compensated before making the adjustment [⇒ page 209](#). If the values still diverge from the specification, it may be necessary to replace the rear axle.
- 4 - Check the front axle convergence and adjust it if necessary  
[⇒ page 212](#). If the values are out of tolerance, the tilting to one of the vehicle sides must be checked and, if necessary, compensated before performing the adjustment  
[⇒ page 209](#).

In general

If a value lies outside the tolerance, the vehicle's transverse tilting must be checked first [⇒ page 209](#).

## 2.6 Nominal values for vehicle alignment

Specifications valid for all engines [⇒ page 207](#).

Specifications valid for all engines on vehicles in "zero" transverse tilting position [⇒ page 208](#).

### 2.6.1 Specifications valid for all engines

- ◆ Explanations related to the PR numbers [⇒ page 206](#)

Nominal values for the front axle

PR numbers	G01	G09 / G16	G10	G26	G25 / G23	G14	G15	G17 / G28	G18 / G19	G22	G18 / G19 / G27 (GP 2)
Convergence (without compression)	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'
Difference of the convergence angle with steering wheel turning of 20° to the left and to the right	1°18' ± 20'	1° 28' ± 20'	+1° 22' ± 20'	46' ± 20'	53' ± 20'	1° 40' ± 20'	1° 28' ± 20'	1° 44' ± 20'	1° 25' ± 20'	55' ± 20'	1° 40' ± 20'
Camber (in straight line position)	-55' ± 30'	-15' ± 30'	-30' ± 30'	-30' ± 30'	-15' ± 30'	-21' ± 30'	-15' ± 30'	-42' ± 30'	-22' ± 30'	-22' ± 30'	-21' ± 30'
Maximum difference admissible between the left and right sides (Camber)	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'



PR numbers	G01	G09 / G16	G10	G26	G25 / G23	G14	G15	G17/ G28	G18 / G19	G22	G18 / G19 / G27 (GP 2)
Caster (not adjustable)	3°50' ± 30'	+4° 14' ± 30'	+4° 30' ± 30'	+3° 02' ± 30'	+2° 42' ± 30'	3° 55' ± 30'	+4° 14' ± 30'	+4° 09' ± 30'	+4° 26' ± 30'	+3° 00' ± 30'	3° 55' ± 30'
Maximum difference admissible between the left and right sides (Caster)	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'

#### Nominal values for the rear axle

PR numbers	G01	G14	G09 / G16 / G15 / G23 / G25	G10 / G26	G17/G28	G18 / G19 / G22	G18/G19 / G27 (GP2)
Camber	-1°52' ± 30'	-1°30' ± 30'	-1°22' ± 30'	-1°22' ± 30'	-2° ± 30'	-1° 22' ± 30'	-1° 22' ± 30'
Maximum difference admissible between the left and right sides (Camber)	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'
Convergence (without compression)	25' ± 10'	16' ± 10'	+16' ± 10'	+24' ± 10'	+26' ± 10'	+20' ± 10'	+16' ± 10'
Geometric axle (maximum movement of the travelling angle)	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'

#### 2.6.2 Specifications valid for all engines on vehicles in "zero" transverse tilting position

- ◆ Explanation related to the "zero" vehicle transverse tilting position [⇒ page 209](#)
- ◆ Explanations related to the PR numbers [⇒ page 206](#)

#### Nominal values for the front axle

PR numbers	G01	G09 / G16	G10	G26	G25 / G23	G14	G15	G17/ G28	G18 / G19	G22	G18 / G19 / G27 (GP 2)
Convergence (without compression)	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'
Difference of the convergence angle with steering wheel turning of 20° to the left and to the right	1°18' ± 20'	1° 28' ± 20'	+1° 22' ± 20'	46' ± 20'	53' ± 20'	1° 40' ± 20'	1° 28' ± 20'	1° 44' ± 20'	1° 25' ± 20'	55' ± 20'	1° 40' ± 20'
Camber (in straight line position)	-55' ± 30'	-15' ± 30'	-30' ± 30'	-30' ± 30'	-15' ± 30'	-21' ± 30'	-15' ± 30'	-42' ± 30'	-22' ± 30'	-22' ± 30'	-21' ± 30'



PR numbers	G01	G09 / G16	G10	G26	G25 / G23	G14	G15	G17 / G28	G18 / G19	G22	G18 / G19 / G27 (GP 2)
Maximum difference admissible between the left and right sides (Camber)	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'
Caster (not adjustable)	$3^{\circ}50' \pm 30'$	$+4^{\circ}14' \pm 30'$	$+4^{\circ}30' \pm 30'$	$+3^{\circ}02' \pm 30'$	$+2^{\circ}42' \pm 30'$	$3^{\circ}55' \pm 30'$	$+4^{\circ}14' \pm 30'$	$+4^{\circ}09' \pm 30'$	$+4^{\circ}26' \pm 30'$	$+3^{\circ}00' \pm 30'$	$3^{\circ}55' \pm 30'$
Maximum difference admissible between the left and right sides (Caster)	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'	max. 30'

#### Nominal values for the rear axle

PR numbers	G01	G14	G09 / G16 / G15 / G23 / G25	G10 / G26	G17/G28	G18 / G19 / G22	G18/G19 / G27 (GP2)
Camber	$-1^{\circ}52' \pm 30'$	$-1^{\circ}22' \pm 30'$	$-1^{\circ}30' \pm 30'$	$-1^{\circ}22' \pm 30'$	$-2^{\circ} \pm 30'$	$-1^{\circ}22' \pm 30'$	$-1^{\circ}22' \pm 30'$
Maximum difference admissible between the left and right sides (Camber)	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'
Convergence (without compression)	$25' \pm 10'$	$16' \pm 10'$	$+16' \pm 10'$	$+24' \pm 10'$	$+26' \pm 10'$	$+20' \pm 10'$	$+16' \pm 10'$
Geometric axle (maximum movement of the travelling angle)	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'	max. 20'

## 2.7 Vehicles in “zero” transverse tilting position

If the alignment values are outside the permitted tolerances, the cause may be incorrect vehicle tilting

Vehicles with steering wheel on the right or, for example, vehicles with automatic gearbox can lean to one side slightly.

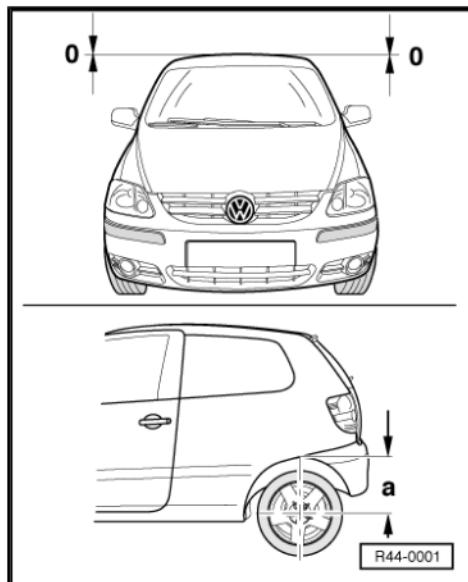
This is due to the installation position of the assemblies and their associated weight transfer, and this is normal.

- Then, it is absolutely necessary to measure the distance -“a”- from the left and right sides.

The -line 0- on the roof indicates the horizontal (zero) position of the vehicle.



Vehicles (5Z1, 5Z6):



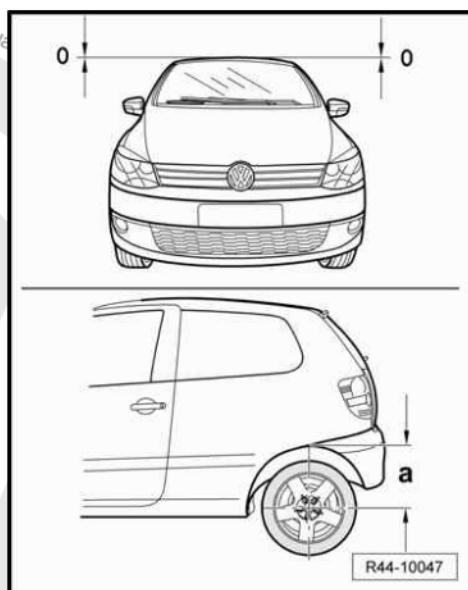
Vehicles (5Z3, 5Z7):

- Correct the differences, if necessary.

On the front axle, compensate this difference by adding weights on top of the respective suspension strut.

On the rear axle, compensate this difference by adding weights to the respective side of the luggage compartment.

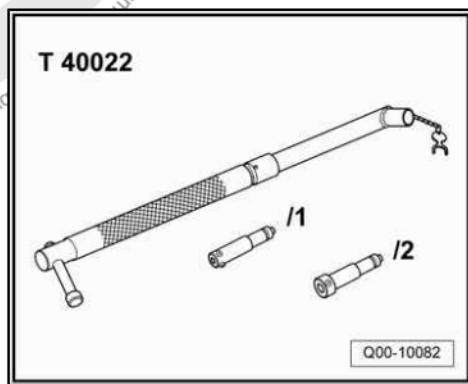
Sandbags, approx. weight 10 kg are appropriate for this purpose.



## 2.8 Camber on front axle - adjust

Special tools and workshop equipment required

- ◆ Adjustment tool - T 40022-

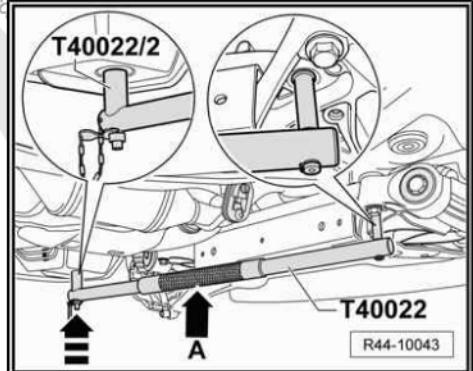




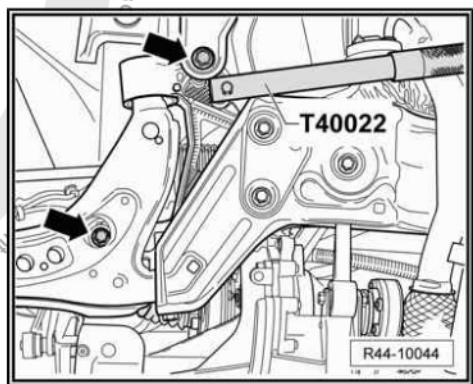
### Note

*Move the auxiliary frame (assembly mounting) to the left or the right, but never forwards or backwards!*

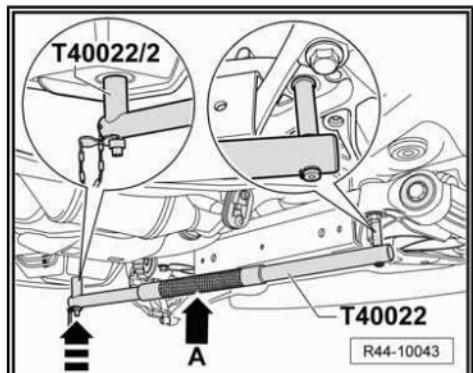
- Remove the noise insulation, if any ⇒ General body repairs exterior; Rep. gr. 50 ; Body - front section .
- Install the Adjustment tool - T40022- with the Adapter - T40022/2- on the floor and console and apply a slight pressure.



- Loosen the screws -arrows- that fasten the console and the auxiliary frame (assembly mounting) to the body on only one side.
- Specifications for camber can be adjusted by turning the cable -arrow A- ⇒ [page 207](#) .
- If the value specified cannot be achieved, then loosen the screws that fasten the console and the auxiliary frame (assembly mounting) to the body on the other side and adjust again.
- When specified value is achieved. Install new screws to fasten the auxiliary frame to body. Tightening torque, see ⇒ [Item 11 \(page 17\)](#) .
- Then, release the cable -arrow A-.
- Press the Adapter - T40022/2- in the direction of the arrow, and remove the adjusting tool.
- Tighten the auxiliary frame screws to body  
 ⇒ [Item 11 \(page 17\)](#) .



If a value remains out of tolerance, the transverse inclination of the vehicle must be checked and compensated, if necessary , and repeat the adjusting procedure ⇒ [page 209](#) .



## 2.9 Camber on rear axle - adjust

The camber cannot be adjusted

If a value lies off the tolerance, the transverse inclination of the vehicle must be checked and compensated, if necessary  
 ⇒ [page 209](#)

If the measured values lie off the permitted tolerances, the axle beam must be checked for damage and replaced, if necessary



## 2.10 Convergence on rear axle - adjust

The convergence cannot be adjusted.

If a value lies outside the tolerance, the transverse tilting of the vehicle must be checked first [⇒ page 209](#).

If the measured values lie off the permitted tolerances, the axle beam must be checked for damage and replaced, if necessary.

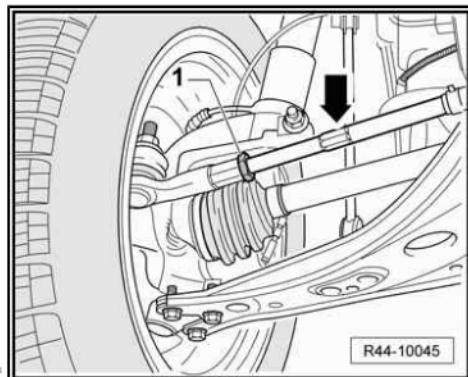
## 2.11 Convergence on front axle - adjust

- Release the locknut -1-.
- Adjust the convergence by turning the track rod to the left and/or to the right.
- To do this, use a spanner on the hex head -arrow- of the steering linkage bar.



### Note

- ◆ After turning the track rods, confirm if the boots are not twisted.
- ◆ Twisted boots wear out quickly



- Tighten the locknut -1-. Tightening torque, see [⇒ page 212](#).

After tightening the locknut -1-, it is possible that the adjusted value slightly changes.

- Check the convergence value once more

If the convergence value measured lies within the tolerance, the adjustment is correct.

### Tightening torque

Component	Tightening torque
Track rod locknut	50 ± 5 Nm

## 2.12 Left and right-hand steering - check

This checking is only necessary if:

- ◆ the steering turns until the stop are different in more than 2° (degrees), from the centre steering wheel position
- ◆ on one side, there is contact between the tyre and parts of front axle or body when fully turning the steering wheel
- ◆ the left steering wheel turning diameter is different from that in the right side



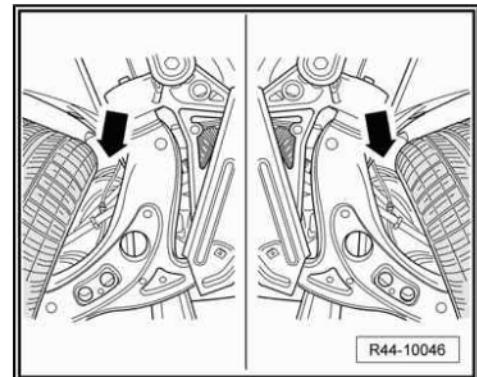
The distances between the axle wishbones and tyres -arrow- must be the same with maximum steering.

If the distances are different, they can be corrected by turning the track rods to the left or to the right.

For example:

If the right steering angle is smaller than the left one:

- Loosen the locknuts from the track rods.
- Turn the left track rod anticlockwise (loosen from the track rod joint).
- To reach the same dimensions, turn the right track rod on the opposite direction and in the same proportion (bolt to the track rod joint).
- Check total convergence.



Check if the total convergence is still on the prescribed specifications after completing the adjustment!

- Tighten the locknut -1-. Tightening torque, see [page 213](#).

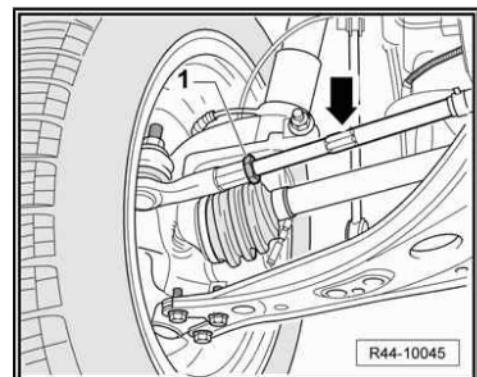
After tightening the locknut -1-, it is possible that the adjusted value slightly changes.

If the set value does not deviate by more than 2' from specification, the setting is OK.



Note

*After turning the track rods, make sure that the boots are not twisted!*



#### Tightening torque

Component	Tightening torque
Track rod locknut	50 ± 5 Nm

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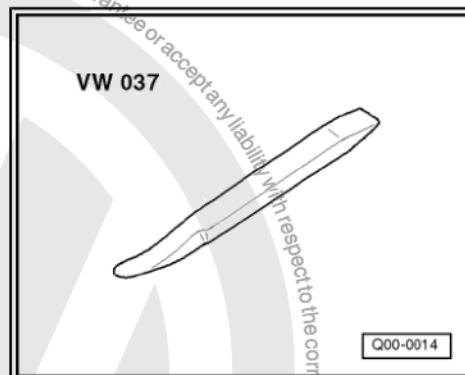
## 48 – Steering

### 1 Steering wheel

#### 1.1 Horn actuator - H- - remove and install

Special tools and workshop equipment required

- ◆ Scraper - VW 037-



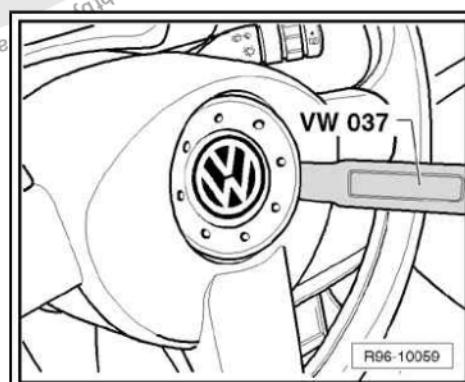
Steering wheel with ignition device for driver's air bag - N95- , refer to ⇒ Body - Internal assembly works; Rep. gr. 69 ; Passenger protection .

#### 1.1.1 Removal

- Turn the ignition and all electric consumers off, and remove the key from ignition.
- Disconnect the Battery - A ⇒ Electrical devices; Rep. gr. 27 ; Starter, alternator, battery .

Vehicles without Airbag:

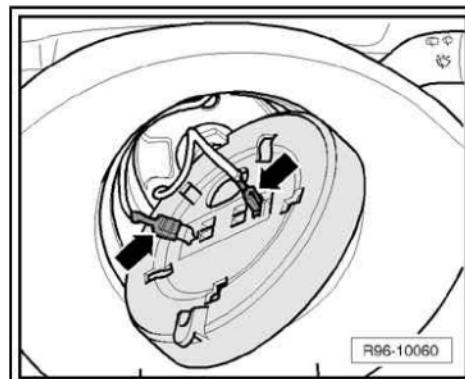
- Carefully remove the Horn actuator - H- using the Scraper - VW 037- .



- Disconnect the terminals -arrows-.
- Remove the Horn actuator - H- .

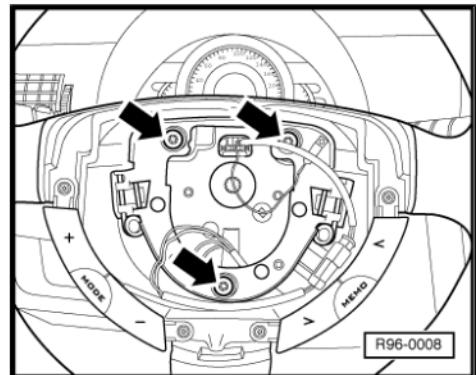
Vehicles with airbag:

- Remove the Igniter for driver's airbag - N95- ⇒ Body - Internal assembly work; Rep. gr. 69 ; Passenger protection .



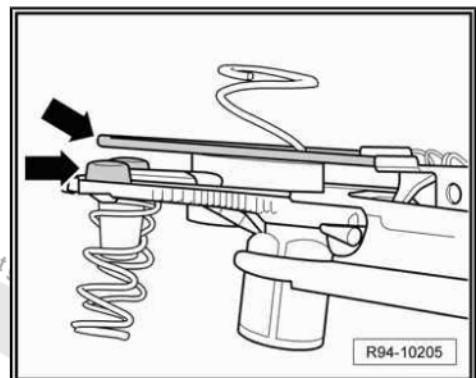


- Remove the fastening bolts -arrows- in the contact support.
- Disconnect the connector and remove the contact support.



#### Note

*Make sure that the contact surfaces of the support, as well as the contact terminals in the steering wheel -arrows-, be clean (with metal visible) before the installation.*



### 1.1.2 Installation

Installation is performed in reverse to removal sequence.

## 1.2 Steering wheel and Horn actuator - H - assembly overview

Version 1:



1 - Screw

- 30 Nm + 90°
- Replace once removed

2 - Horn actuator - H-

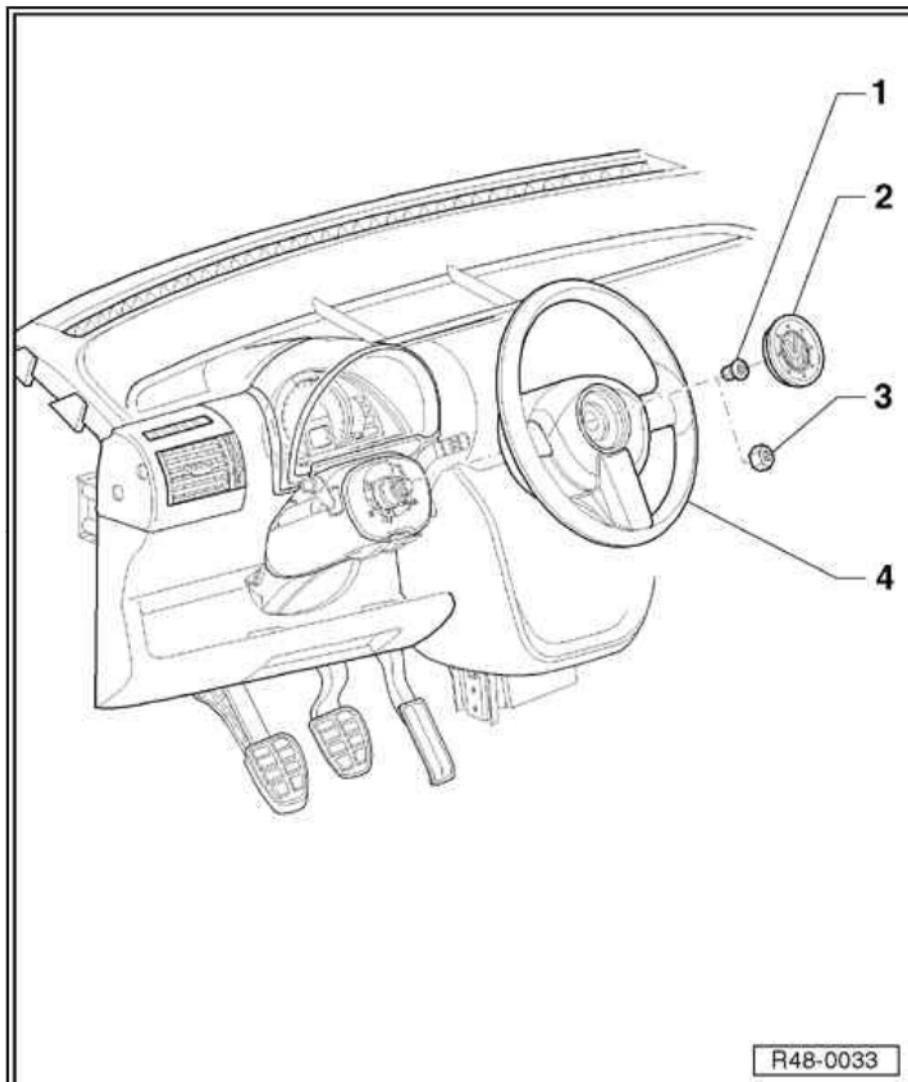
- Remove and install  
[⇒ page 214](#)

3 - Hexagonal nut

- $50 \pm 5$  Nm
- Replace once removed
- For fixed steering column.

4 - Steering wheel

- Different versions
- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install  
[⇒ page 219](#)
- The centre marks on the steering wheel and steering column should match during assembly  
[⇒ page 204](#)



Version 2:



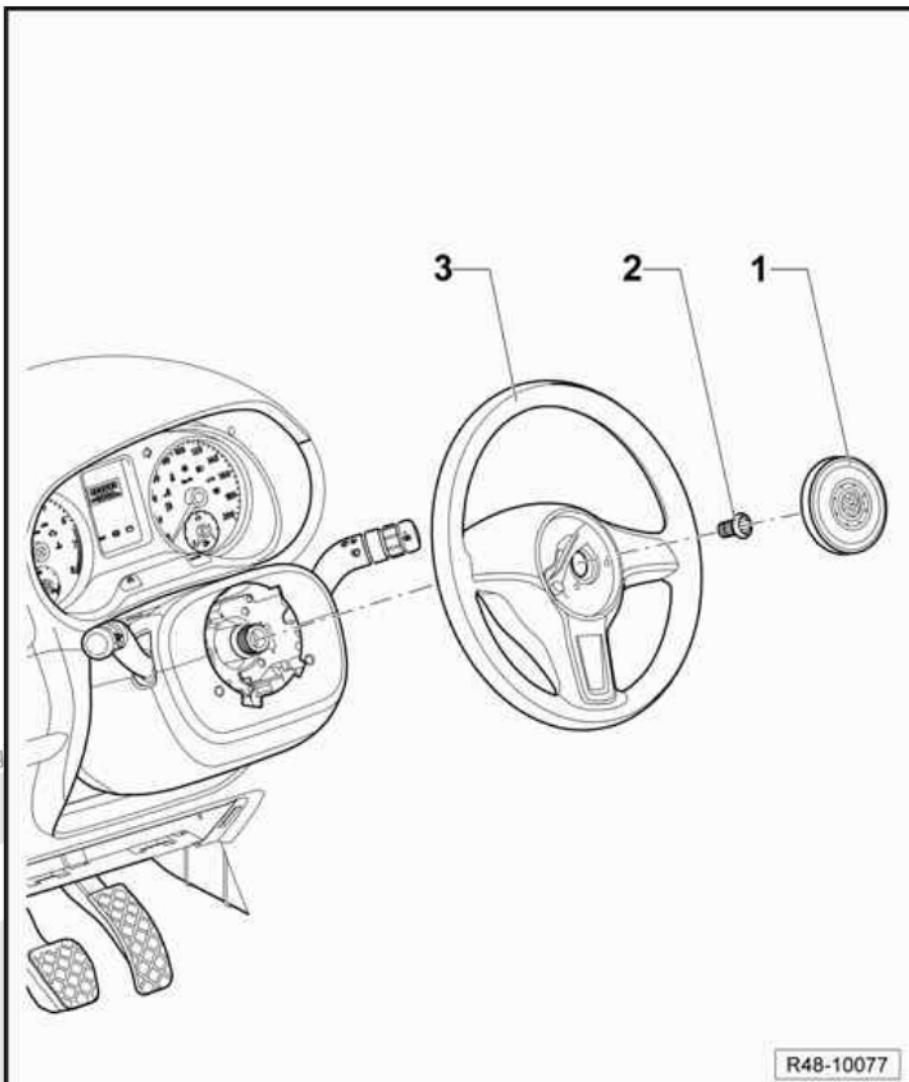
1 - Horn actuator - H-

2 - Screw

- 30 Nm + 90°
- Replace once removed

3 - Steering wheel

- Different versions
- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install  
⇒ [page 219](#)
- The centre marks on the steering wheel and steering column should match during assembly  
⇒ [page 204](#)



R48-10077

Version 3:

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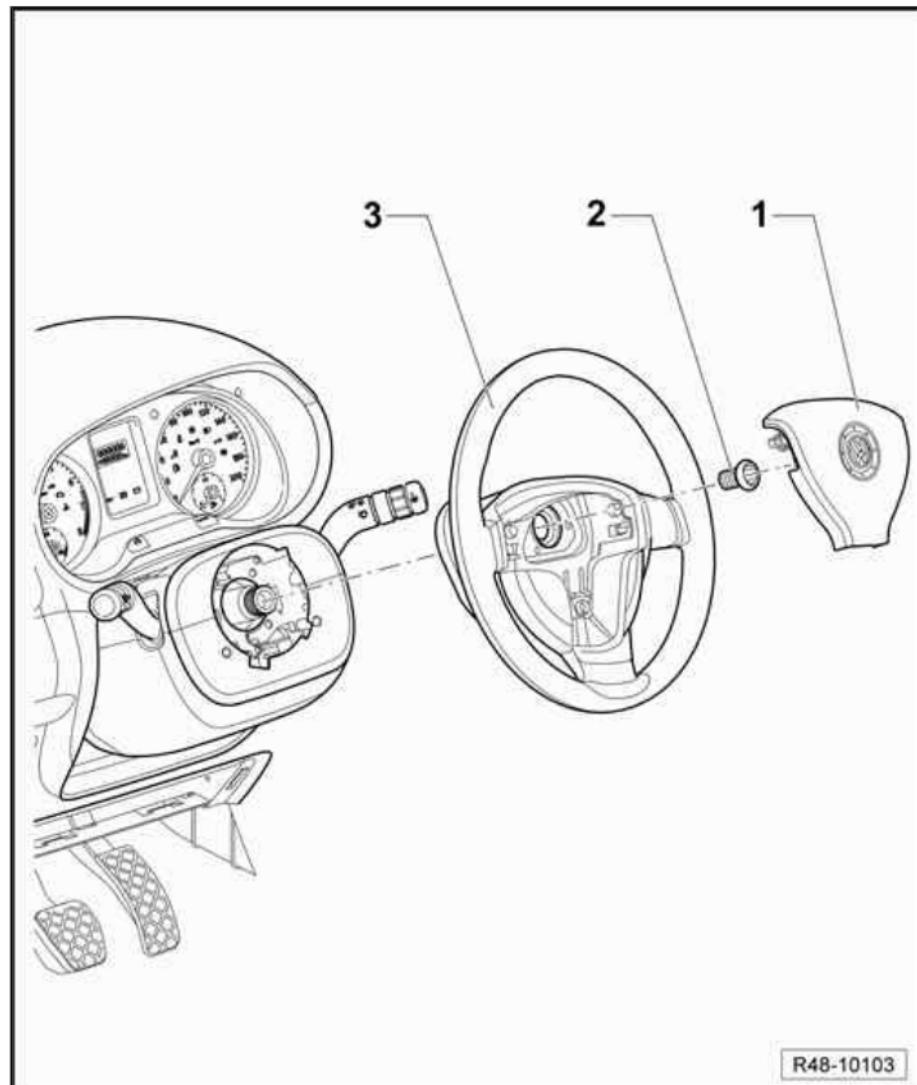
1 - Horn actuator - H-

2 - Screw

- 30 Nm + 90°
- Replace once removed

3 - Steering wheel

- Different versions
- See: ⇒ Electronic parts catalogue "ETKA"
- Remove and install  
⇒ [page 219](#)
- The centre marks on the steering wheel and steering column should match during assembly  
⇒ [page 204](#)



R48-10103

Version 4:

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1 - Horn actuator - H-

2 - Screw

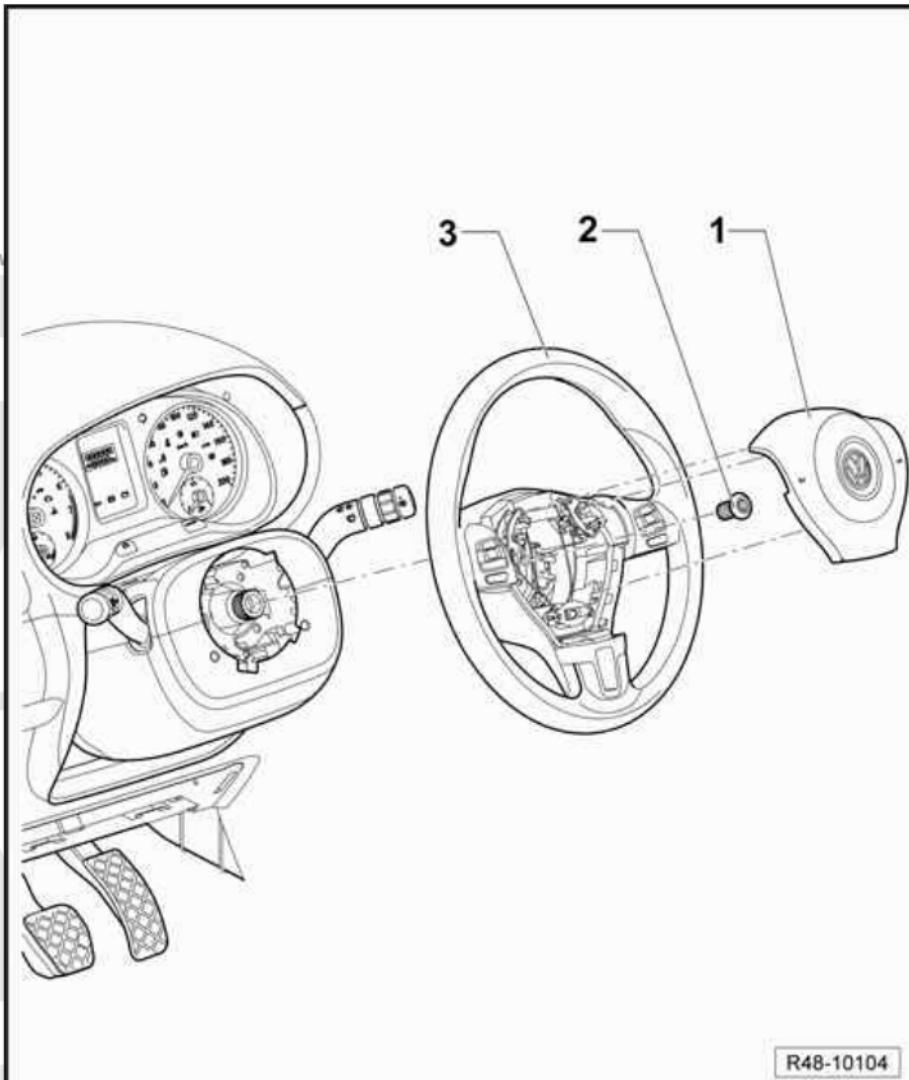
- 30 Nm + 90°
- Replace once removed

3 - Steering wheel

- Different versions
- See: ⇒ Electronic parts catalogue "ETKA"

- Remove and install  
⇒ [page 219](#)

- The centre marks on the steering wheel and steering column should match during assembly  
⇒ [page 204](#)

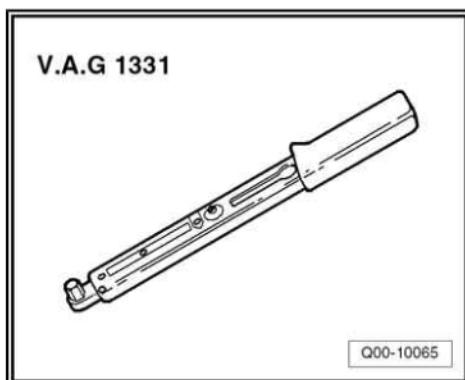


R48-10104

### 1.3 Steering wheel - remove and install

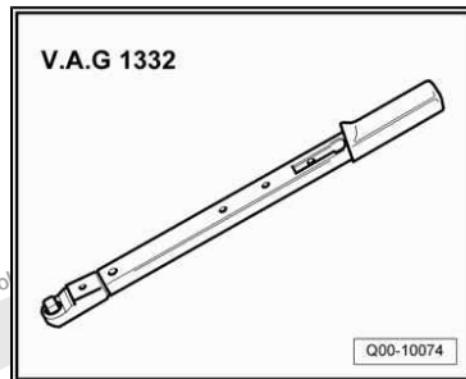
Special tools and workshop equipment required

- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-



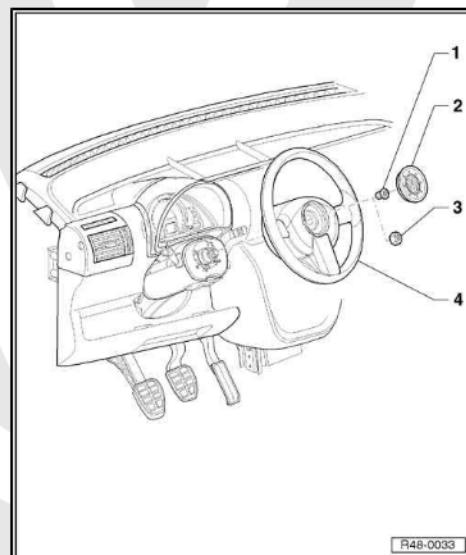


- ◆ Torque wrench - 40 to 200 Nm ( 1/2") - VAG 1332-



### 1.3.1 Removal

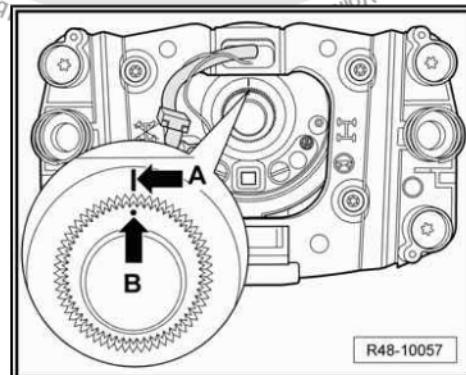
- Put the vehicle wheels in a straight line position.
- Remove the Horn actuator - H- -2- [⇒ page 214](#).
- Remove the (internal multi-tooth) bolt -1- or the union nut -3-.



#### Note

*Before removing the steering wheel, check if the mark -arrow A- is aligned with the punch mark in the steering column -arrow B-.*

- Remove the steering wheel -4-.





### 1.3.2 Installation

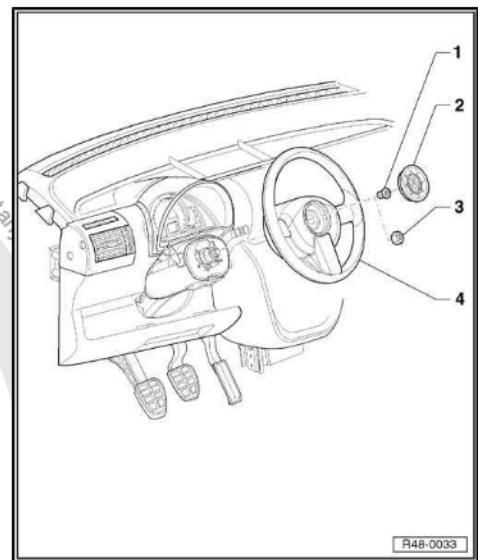
- Place the steering wheel -4- on the steering column.



#### Note

*The centre marks on the steering wheel and steering column shall match [page 204](#).*

- Install new bolt -1- and tighten it with a torque of  $30 \text{ Nm} + 90^\circ$ .
- or
- Install the hex nut -3- and tighten to the torque of  $50 \pm 5 \text{ Nm}$ .
- Install the Horn actuator - H- -2- [page 214](#).





## 2 Fixed steering column - repair



### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

### 2.1 Fixed steering wheel support and column - assembly overview

For vehicles (5Z1):

1 - Fixed steering column

- Remove and install  
⇒ [page 223](#)

2 - Hexagonal bolt

- $23 \pm 2 \text{ Nm}$
- Replace once removed

3 - Screw

4 - Hexagonal nut

- $15 \text{ Nm} + 50^\circ$
- Replace once removed

5 - Bushing

- Check the state after removing the steering column

6 - Screw

- 7 Nm
- Replace once removed

7 - Mounting bracket

8 - Hexagonal bolt

- 23 Nm

9 - Structure, right

- Frequency arm set

10 - Cross member

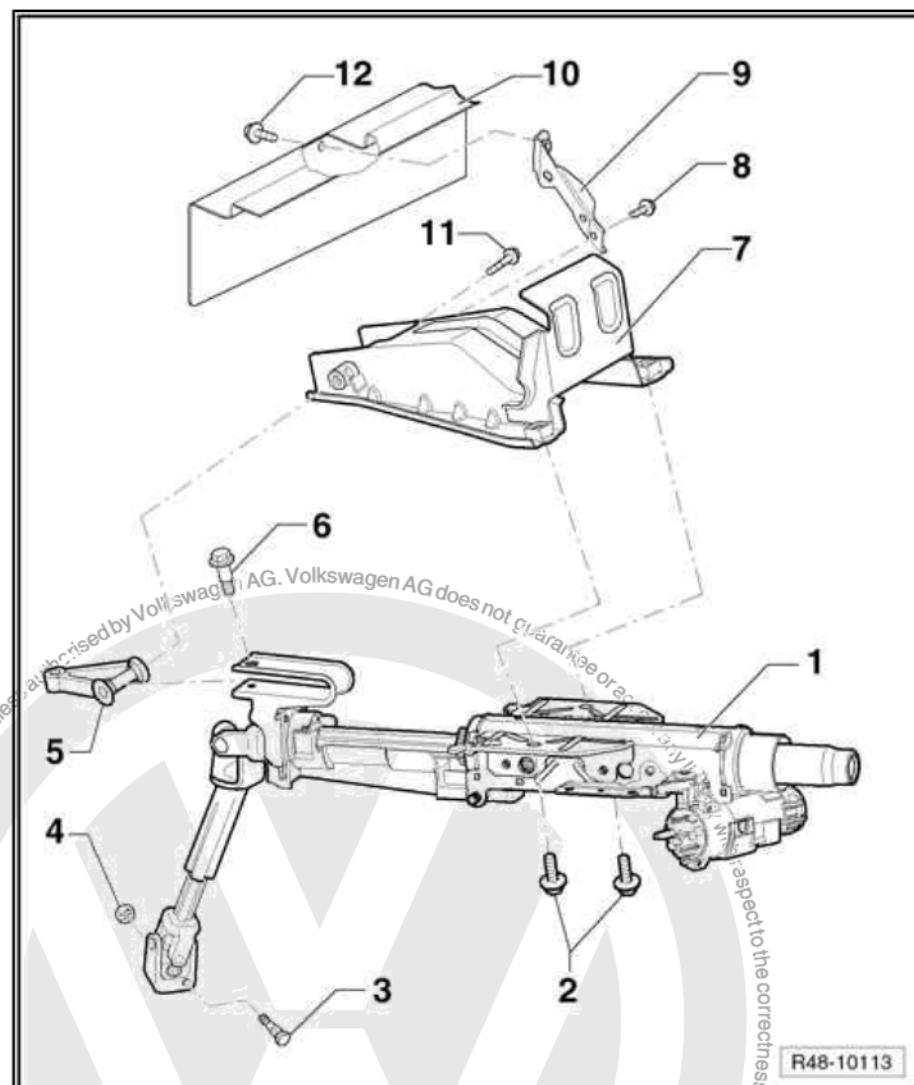
- Remove and install ⇒ General body repairs, interior; Rep. gr. 70 ; Lining / insulation

11 - Screw

- 8 Nm

12 - Combined bolt

- $25 \pm 4 \text{ Nm}$



For vehicles (5Z3):



1 - Cross member

- Remove and install ⇒  
 General body repairs, interior; Rep. gr. 70 ;  
 Lining / insulation

2 - Hexagonal bolt

- 8 Nm

3 - Fixed steering column

- Remove and install  
[⇒ page 223](#)

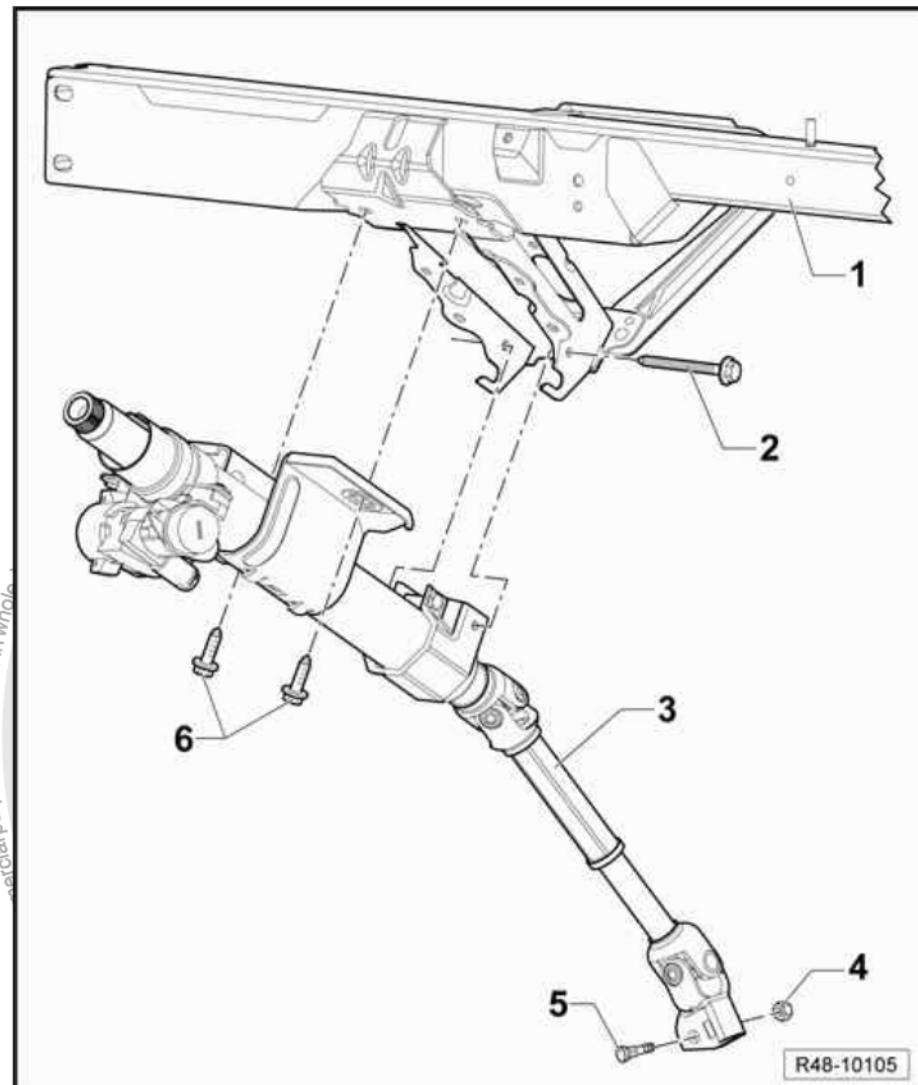
4 - Hexagonal nut

- 15 Nm + 50°
- Replace once removed

5 - Screw

6 - Hexagonal bolt

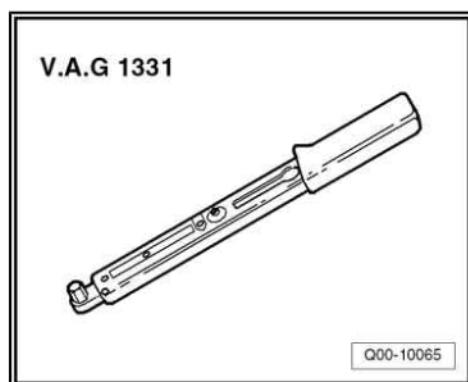
- 23 ± 2 Nm



2.2 Fixed steering column - remove and install

Special tools and workshop equipment required

- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-



2.2.1 Removal

The steering column is supplied complete as a spare part. Repair is not permitted.

The switchbox cover can be transferred.

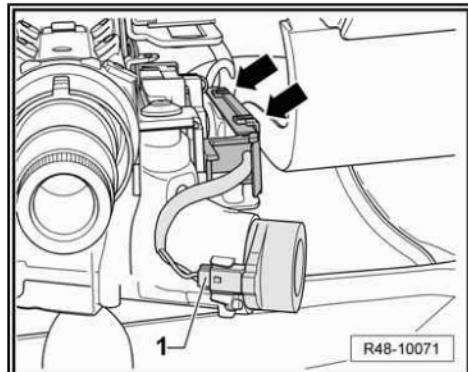


### WARNING

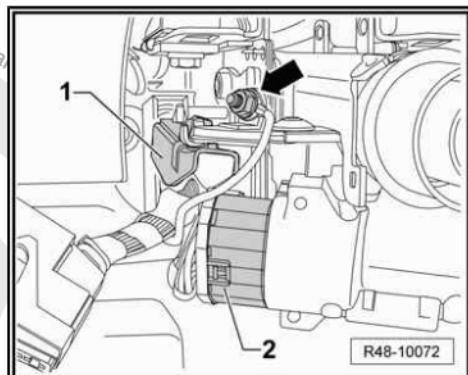
*Before starting to work on the electric system and removing the steering wheel, the following conditions must be met:*

- ◆ *Disconnect the earth wire from the Battery - A- ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery*
- ◆ *The wheels must be in the straight line position*

- Set the wheels to the straight line position.
- Remove the steering wheel [page 214](#) .
- Remove the steering column covering ⇒ General body repairs, interior; Rep. gr. 70 ; Lining / Insulation .
- Remove the switch set ⇒ Electrical equipment; Rep. gr. 94 ; Switches, lights and external lamps .
- Disconnect the connector -1- from the Immobilizer reading coil - D2- .
- Open the support (right side) of the cables on the tabs -arrows- and remove the cable.
- Loosen the union nut -arrow- and remove the steering column earth wire.

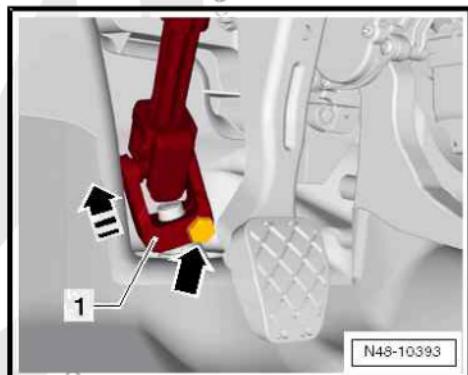


- Remove the cable support (left side) -1- in the switchbox.
- Disconnect the connector -2- from the steering lock set.



- Remove the securing bolt -arrow- from the universal joint -1- and uncouple the universal joint -towards the arrow-.

Remove the access cover to the relay box, to facilitate the operation.

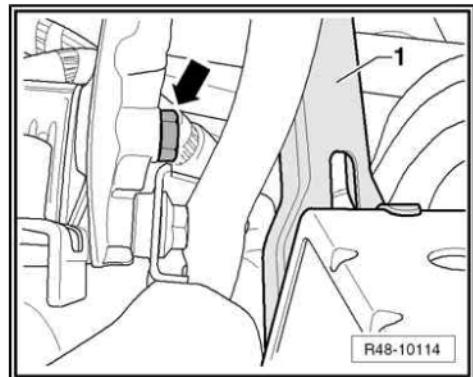




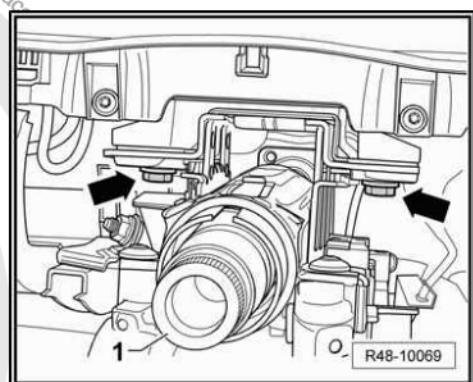
- Remove the securing bolt -arrow- to the left of the pedal set -1- above the steering column support.



*When the vehicle is equipped with Brake support - 6Q1 721 115 H- or Brake support - 6Q1 721 115 D-, it will be necessary to remove it to enable removal of the fastening screw at left of the pedals.*



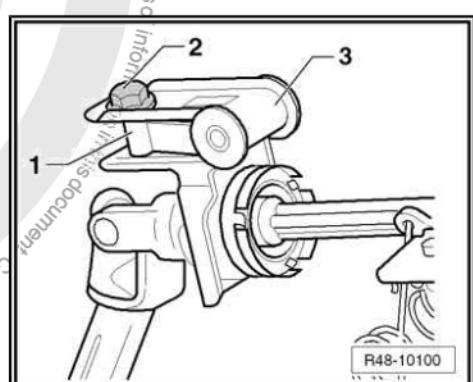
- Remove the brake pedal support ⇒ Brakes - Mechanical system; Rep. gr. 46 : Pedal - remove and install .
- Remove the securing bolts -arrows- and carefully pull the steering column -1- out of its housing.
- Remove the steering lock set ⇒ Electrical equipment; Rep. gr. 94 : Switches, lights and external lamps .
- Check the steering column for damages ⇒ [page 238](#) .



- If the mounting bushing -1- is damaged, replace it.
- Remove the bolt -2-.
- Remove the mounting bush -1- from the steering column fork -3-.



- ♦ If the steering column is replaced, carefully remove the mounting bush -1- and install on the new shaft
- ♦ Before installing the mounting bush, check for damages



## 2.2.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



### WARNING

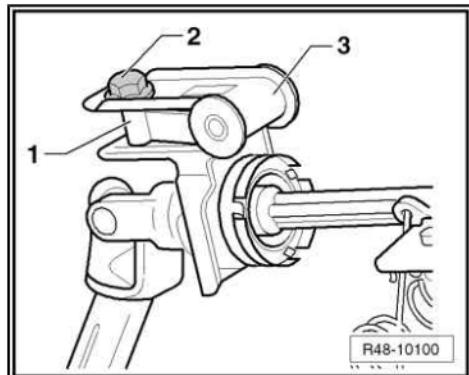
*Always replace self-locking nuts and bolts subject to angular torque*



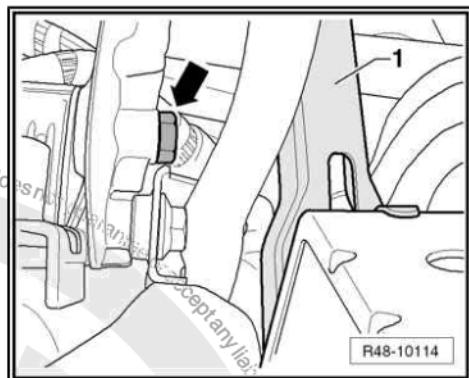
- If the support bushing -1- has been removed because of damages, install a new bushing.

Note

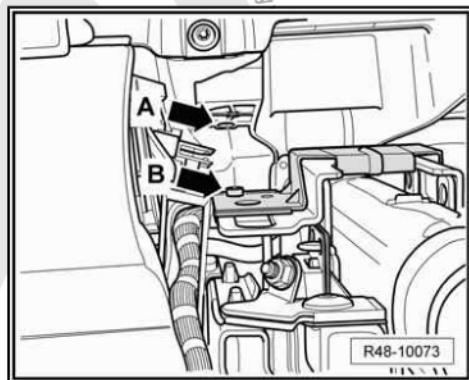
- ◆ If the steering column was replaced, the mounting bush -1- from the old column must be installed on the new column
- ◆ Tighten the fastening screw -2-. Tightening torque, see [⇒ page 228](#)
- ◆ Before installing the mounting bush, check for damages
- ◆ If the mounting bush is damaged, a new one must be installed



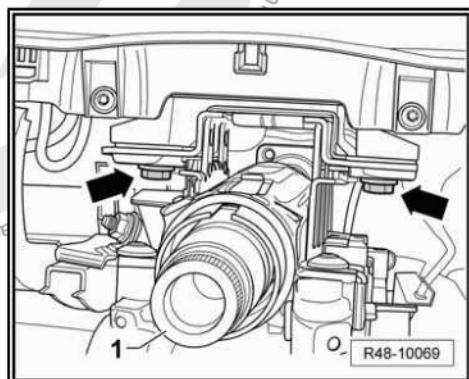
- Install the steering column on the support.
- Install the bolt -arrow- located to the right of the steering column. Tightening torque, see [⇒ page 228](#).



- Align the steering column with the support and install. The hole -arrow A- and the pin -arrow B- must align with each other.



- Install and tighten the steering column screws -arrows- [⇒ page 228](#).
- Install the universal joint on the steering box pinion.

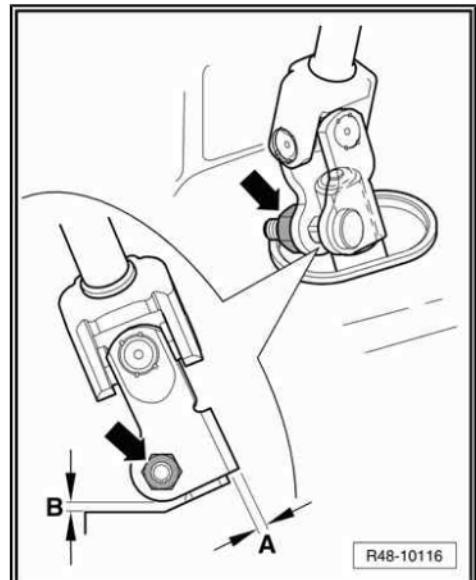




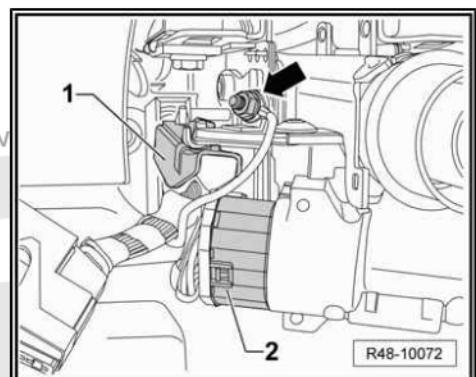
Note

*Measurement -A- should be parallel to the steering box pinion axle and measurement -B- should be the minimal in order not to interfere with the lining.*

- Tighten the union nut -arrow-. Tightening torque, see [⇒ page 228](#) .



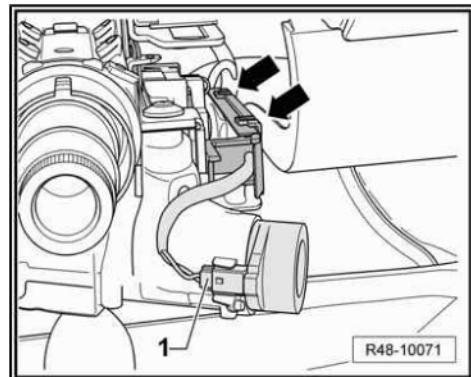
- Connect the connector -2- to the steering lock set.
- Install the earth wire and the switchbox cable on the cable support -1-. Tightening torque, see [⇒ page 228](#) .



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- Install the cable on the support and close the tabs -arrows-.
- Connect the connector -1- to the Immobiliser reading coil - D2- .
- Install the steering lock set ⇒ Electrical equipment; Rep. gr. 94 ; Switches, lights and external lamps .
- Install the steering column covering ⇒ General body repairs, interior; Rep. gr. 70 ; Lining/Insulations .
- Install the switchbox ⇒ Electrical equipment; Rep. gr. 94 ; Switches, lights and external lamps .
- Install the steering wheel [⇒ page 219](#) .



Caution

- ◆ *When connecting the vehicle Battery's - A- earth wire, no one should be inside the passenger compartment ⇒ Body - Internal assembly works; Rep. gr. 69 ; Safety measures for working with airbags*

Tightening torques

Components	Tightening torque
Steering column earth wire	$4.5 \pm 0.5 \text{ Nm}$
Steering box steering column ◆ Use a new nut (vehicles 5Z1) <a href="#">⇒ Item 4 (page 222)</a>  ◆ Use a new nut (vehicles 5Z3) <a href="#">⇒ Item 4 (page 223)</a>	$15 \text{ Nm} + 50^\circ$
Lower steering column fastening ◆ (vehicles 5Z1) <a href="#">⇒ Item 11 (page 222)</a>  ◆ (vehicles 5Z3) <a href="#">⇒ Item 2 (page 223)</a>	$8 \text{ Nm}$
Upper steering column fastening ◆ (vehicles 5Z1) <a href="#">⇒ Item 2 (page 222)</a>  ◆ (vehicles 5Z3) <a href="#">⇒ Item 6 (page 223)</a>	$23 \pm 2 \text{ Nm}$
Bushing support for steering column fork	$7 \text{ Nm}$



### 3 Adjustable steering column - repair



#### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

#### 3.1 Steering support and column (adjustable) - assembly overview

For vehicles (5Z1):

1 - Adjustable steering column

- Remove and install  
[⇒ page 230](#)

2 - Screw

- $23 \pm 2 \text{ Nm}$

3 - Screw

4 - Hexagonal nut

- $15 \text{ Nm} + 50^\circ$

- Replace once removed

5 - Screw

- $M6 \times 63 = 10 \text{ Nm}$

6 - Hexagonal nut

- Self-locking

- replace once removed

7 - Screw

- $7 \text{ Nm}$

8 - Bushing

- Check the state after removing the steering column

9 - Screw

- $M8 \times 85 = 23 \text{ Nm}$
- $M6 \times 63 = 10 \text{ Nm}$



*Hex bolt M8 X 85 without self-locking nut was used until Oct. 31, 2006*

10 - Mounting bracket

11 - Screw

- $23 \text{ Nm}$

12 - Structure, right

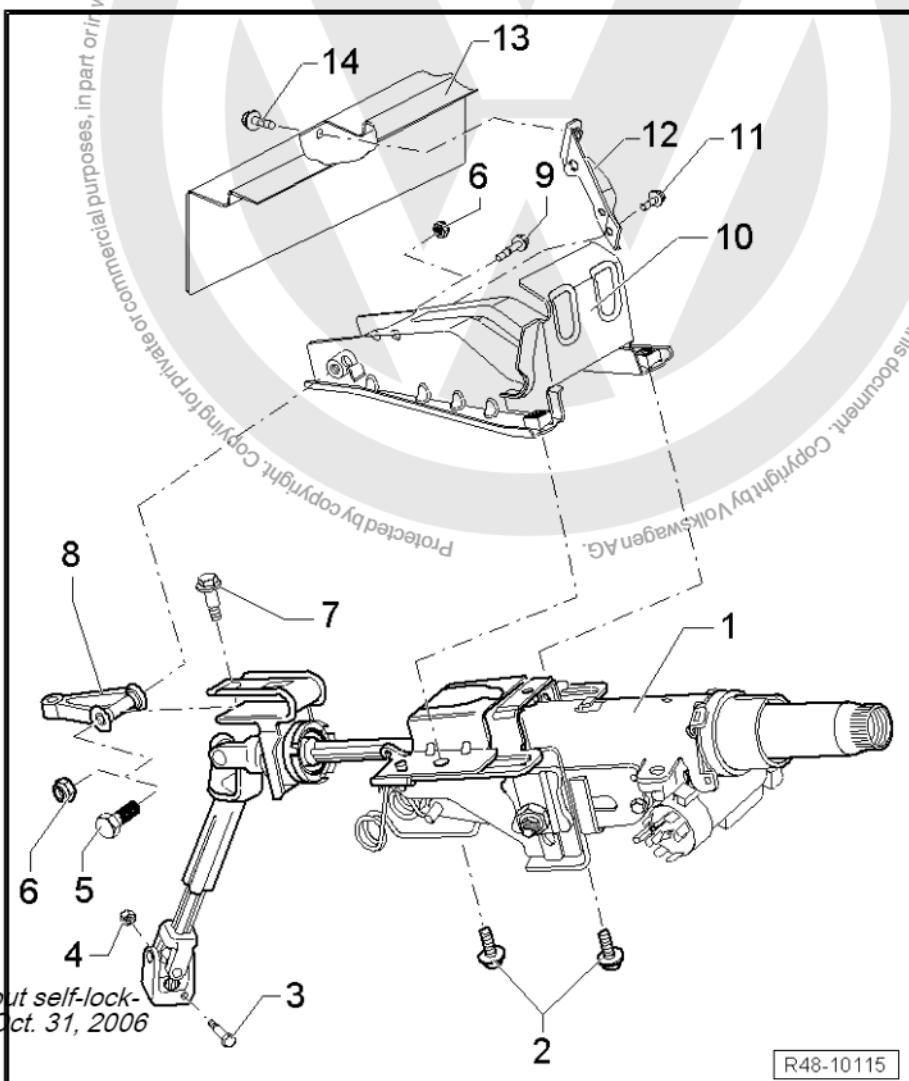
- Frequency arm set

13 - Cross member

- Remove and install ⇒ General body repairs, interior; Rep. gr. 70 ; Lining / insulation

14 - Hexagonal bolt

- $25 \pm 4 \text{ Nm}$



R48-10115



For vehicles (5Z3):

1 - Cross member

- Remove and install ⇒  
General body repairs,  
interior; Rep. gr. 70 ;  
Lining / insulation

2 - Hexagonal bolt

- 8 Nm

3 - Adjustable steering column

- Remove and install  
⇒ [page 230](#)

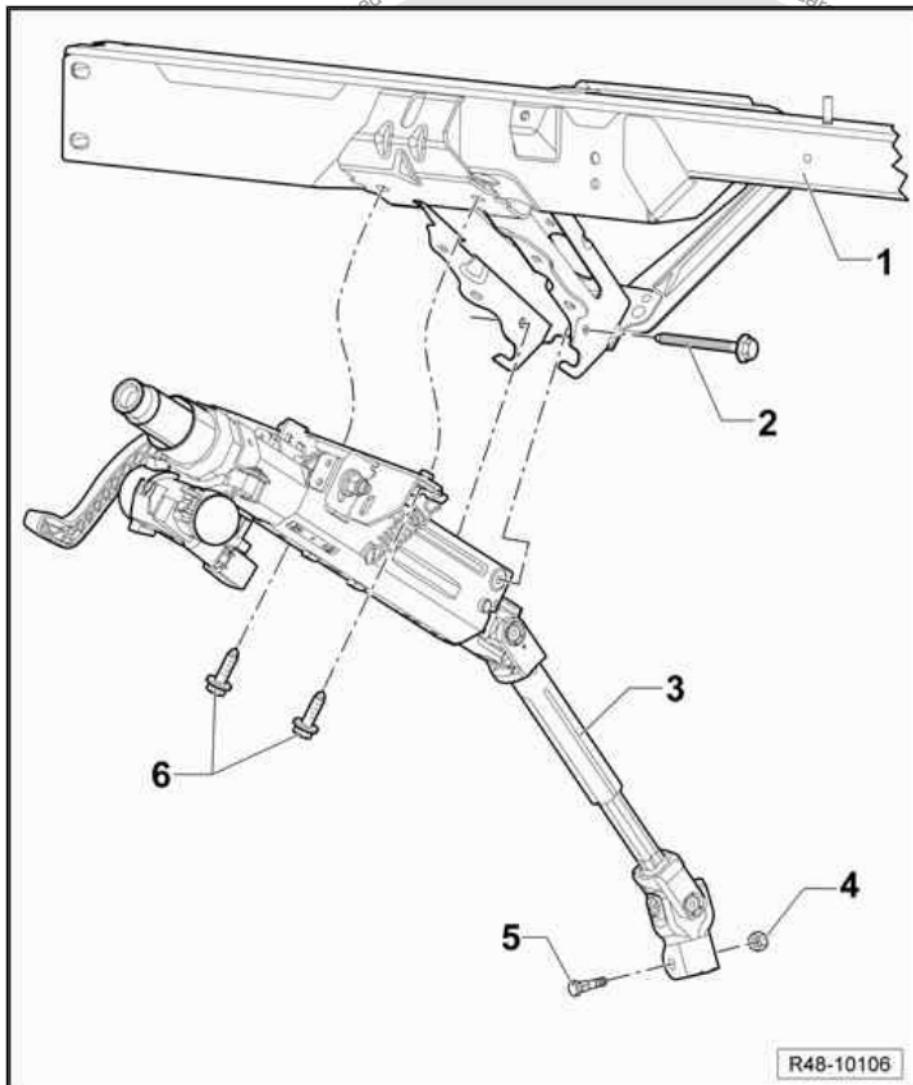
4 - Hexagonal nut

- 15 Nm + 50°
- Replace once removed

5 - Screw

6 - Hexagonal bolt

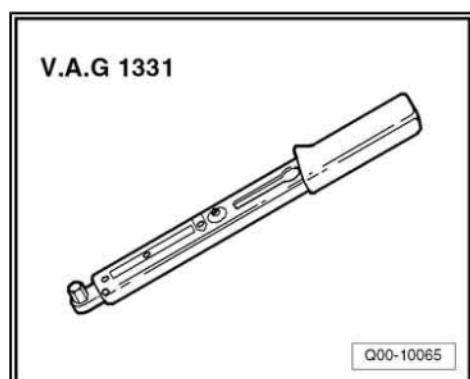
- $23 \pm 2$  Nm



### 3.2 Adjustable steering column - remove and install

Special tools and workshop equipment required

- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-





### 3.2.1 Removal

The steering column is supplied complete as a spare part. Repair is not permitted.

The switchbox cover can be transferred.



#### WARNING

*Before starting to work on the electric system and removing the steering wheel, the following conditions must be met:*

- ◆ *Disconnect the earth wire from the Battery - A ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery*
- ◆ *The wheels must be in the straight line position*

- Set the wheels to the straight line position.
- Pull the lever below the steering column down.
- Move the steering column downward and pull it as much as possible.
- Remove the Trigger for driver's air bag - N95- , if any ⇒ Body - Internal assembly works; Rep. gr. 69 ; Occupants' protection .
- Disconnect the connector-1-, pressing the lock -arrow- down.
- Remove the (internal multiple toothed) bolt from the steering wheel -2-.

Before removing the steering wheel, check whether the marking -arrow A- is aligned with the punch point -arrow B-. In case that does not happen:

- Mark the steering wheel installation position in relation to the steering column with a ball pen or a scribe, for example.
- Remove the steering wheel ⇒ [page 214](#) .
- Remove the steering column trim ⇒ Body - Internal assembly works; Rep. gr. 70 Trims/Insulations .



#### Note

*The upper lining can only be totally removed after removal of the steering column*

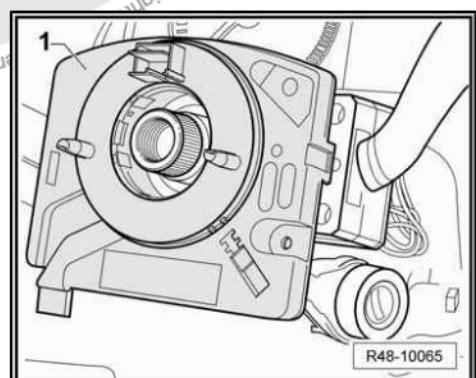
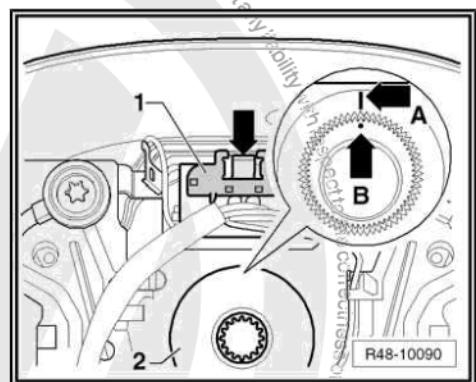
Vehicles with Electronic Stability Program "ESP".

Vehicles equipped with ESP are also equipped with the Steering wheel angle sensor - G85- . It is fitted in the housing-1- along with the contact ring.

After performing work on the switch set, check the basic adjustment of the Steering angle sensor - G85- ⇒ [page 237](#) .

Check if the front wheels are in the straight line position.

- Position the wheels in a straight ahead position and remove the steering wheel, if necessary.

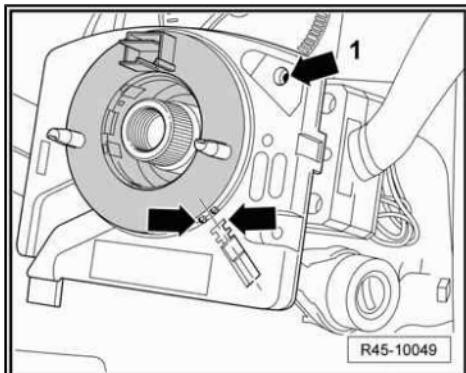




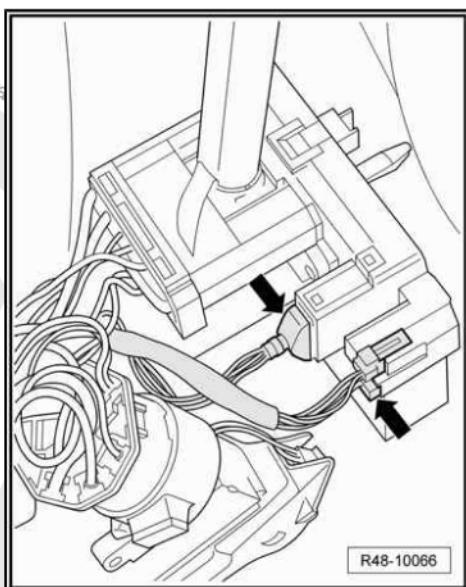
- Position the Steering angle sensor - G85- on the central position.

1 - A yellow dot must be visible through the hole -1-

2 - The marks -arrows- must align



- Disconnect the connectors -arrows-



- Lift the hooks carefully -arrows- and remove the Steering wheel angle sensor - G85- .

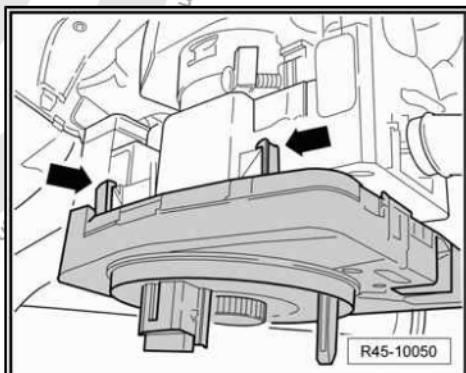
Continuation for all vehicles

- Remove the switch set ⇒ Electrical equipment; Rep. gr. 94 ;  
Switches, lights and external lamps .



Note

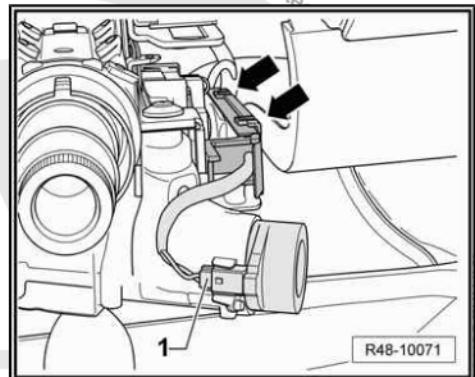
- ◆ The column must be in the central position (wheels in straight line position) when the contact ring is removed and installed
- ◆ The contact ring supplied as a new part is locked in the central position through a cable clamp



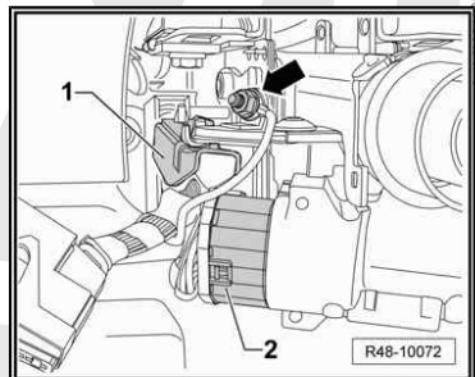
- Disconnect the connector -1- from the Immobilizer reading coil - D2- .



- Open the support (right side) of the cables on the tabs -arrows- and remove the cable.
- Loosen the union nut -arrow- and remove the steering column earth wire.

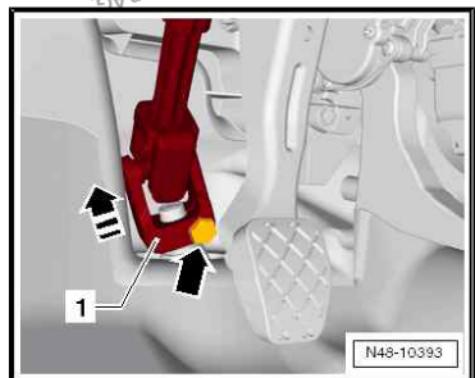


- Remove the cable support (left side) -1- in the switchbox.
- Disconnect the connector -2- from the steering lock set.



- Remove the securing bolt -arrow- from the universal joint -1- and uncouple the universal joint -towards the arrow-.

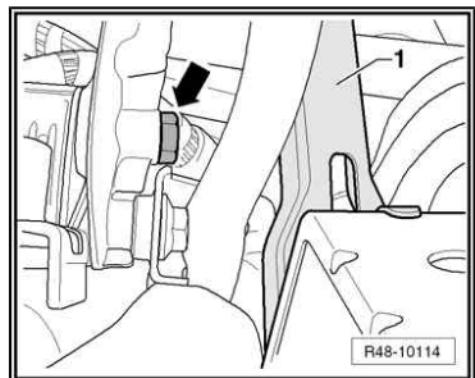
Vehicles with securing screw placed to the right of the steering column



- Remove the securing bolt -arrow- to the left of the pedal set -1- above the steering column support

or

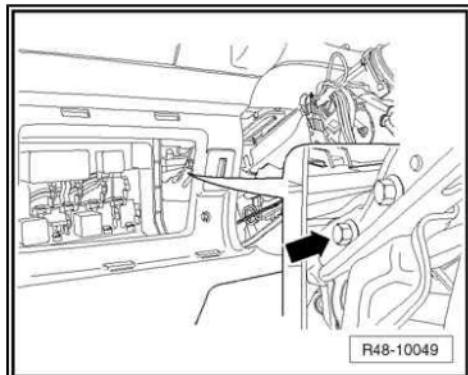
Vehicles with securing screw placed to the left of the steering column



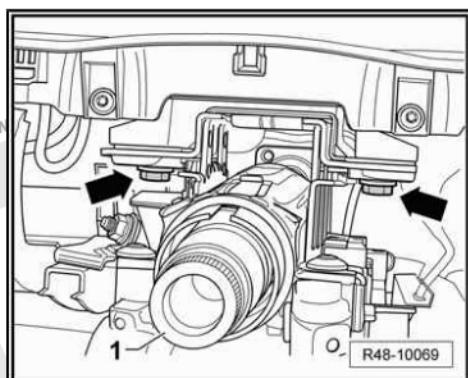


- Remove the screw -arrow- placed to the left and self-locking nut placed to the right of the steering column support.
- Remove the screw -arrow- placed to the left and self-locking nut placed to the right of the steering column support.
- Remove the command switch from the clutch pedal, if necessary.

Continuation for all vehicles



- Remove the securing bolts -arrows- and carefully pull the steering column -1- out of its housing.
- Remove the steering lock set ⇒ Electrical equipment; Rep. gr. 94 ; Switches, lights and external lamps .
- Check the steering column for damages [⇒ page 238](#) .

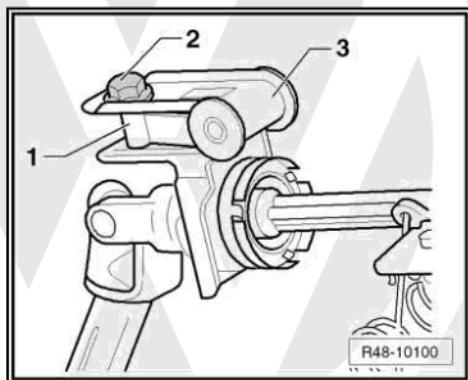


- If the mounting bushing -1- is damaged, replace it.
- Remove the bolt -2-.
- Remove the mounting bush -1- from the steering column fork -3-.



Note

- ◆ *If the steering column is replaced, carefully remove the mounting bush -1- and install on the new shaft*
- ◆ *Before installing the mounting bush, check for damages*



### 3.2.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

*Always replace self-locking nuts and bolts subject to angular torque*

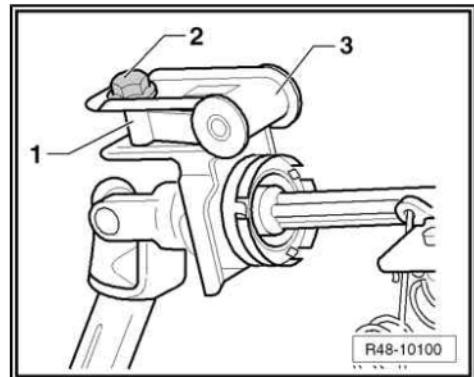


- If the support bushing -1- has been removed because of damages, install a new bushing.



Note

- ◆ If the steering column was replaced, the mounting bush -1- from the old column must be installed on the new column
- ◆ Tighten the fastening screw -2-. Tightening torque, see [⇒ page 238](#)
- ◆ Before installing the mounting bush, check for damages
- ◆ If the mounting bush is damaged, a new one must be installed



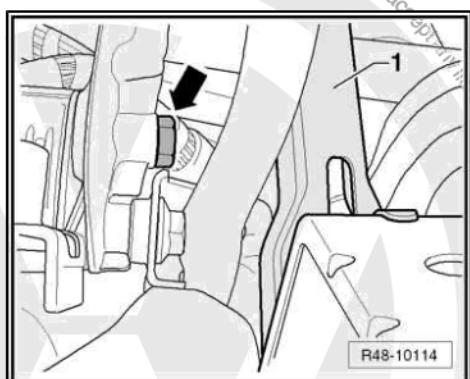
- Install the steering column on the support.

Vehicles with securing screw placed to the right of the steering column

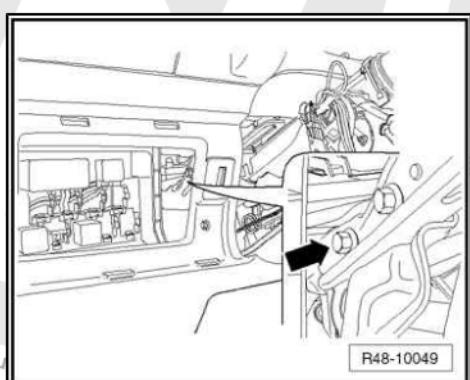
- Install the bolt -arrow- located to the right of the steering column. Tightening torque, see [⇒ page 238](#).

or

Vehicles with securing screw placed to the left of the steering column

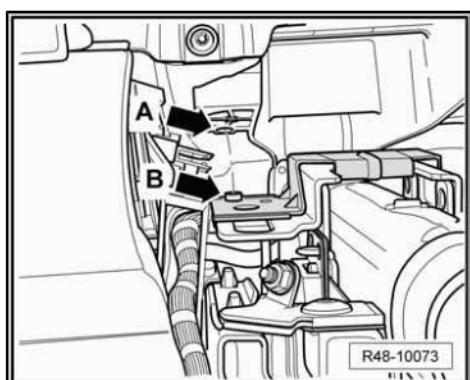


- Install the bolt -arrow- placed to the left and self-locking nut placed to the right of the steering column support. Tightening torque, see [⇒ page 238](#).
- In case it has been removed, install the clutch pedal command switch.



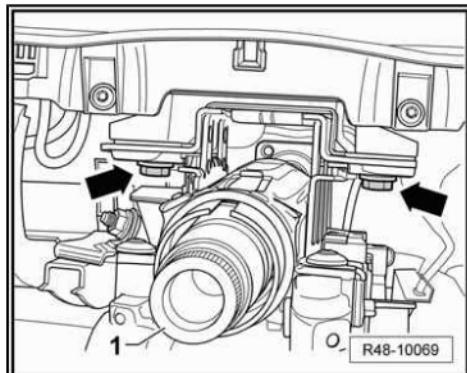
- Align the steering column with the support and install.

The hole -arrow A- and the pin -arrow B- must align with each other.



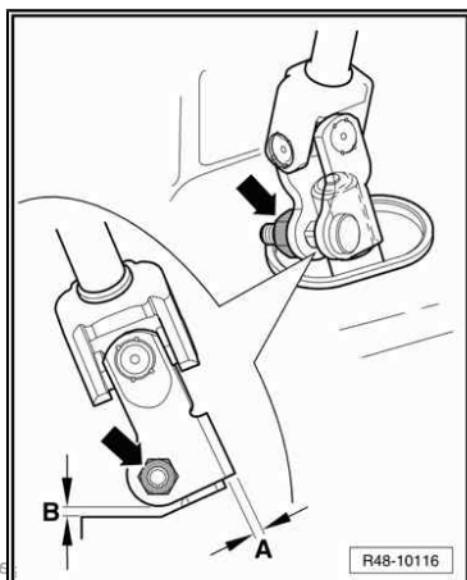


- Install and tighten the steering column screws -arrows- [⇒ page 238](#) .
- Install the universal joint on the steering box pinion.

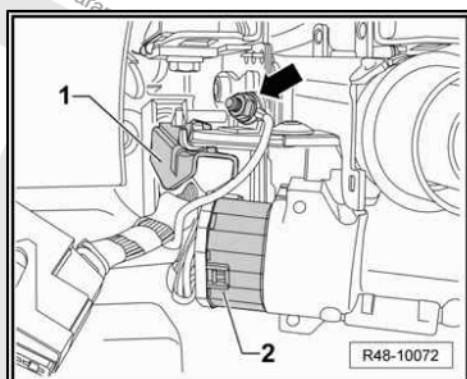


*Measurement -A- should be parallel to the steering box pinion axle and measurement -B- should be the minimal in order not to interfere with the lining.*

- Tighten the union nut -arrow-. Tightening torque, see [⇒ page 238](#) .



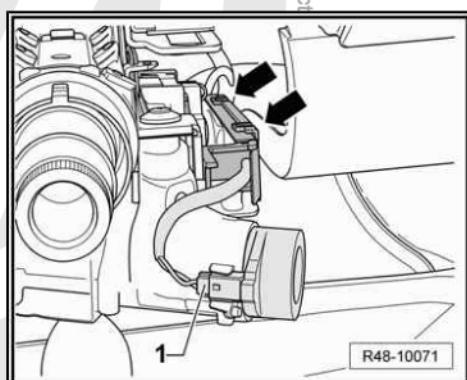
- Connect the connector -2- to the steering lock set.
- Install the earth wire and the switchbox cable on the cable support -1-. Tightening torque, see [⇒ page 238](#) .



- Install the cables on the support and close the tabs -arrows-.
- Connect the connector -1- to the Immobiliser reading coil - D2- .

Continuation for vehicles with ESP:

- Position the Steering angle sensor - G85- until the tabs fit.
- Remove the transport protection when a new Steering wheel angle sensor - G85- is installed.





- Position the Steering angle sensor - G85- on the central position.

1 - A yellow dot must be visible through the hole -1-

2 - The marks -arrows- must align

Make sure the central position is maintained:

The basic adjustment for the steering angle sensor must be checked after the assembly works:

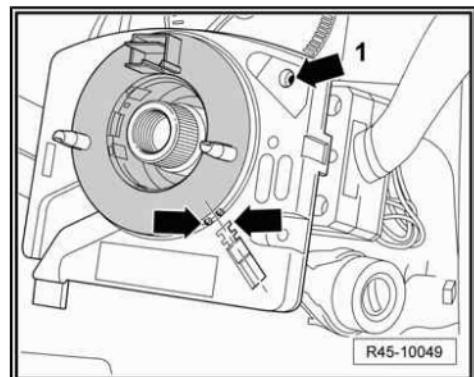
- ◆ when the Steering angle sensor - G85- was removed or replaced
- ◆ after removing or replacing the steering wheel column
- ◆ after removing or replacing the steering wheel column switches
- ◆ after removing or replacing the steering lock assembly
- ◆ when the steering wheel is not in the straight line position

Check the basic adjusting of the Steering angle sensor - G85-

- Turn on the Vehicle diagnostic, testing and information system - VAS 5051- and follow the on-screen instructions.

Continuation for all vehicles:

- Install the steering lock set ⇒ Electrical equipment; Rep. gr. 94 ; Switches, lights and external lamps .
- Install the steering column covering ⇒ General body repairs, interior; Rep. gr. 70 Lining/Insulations .
- Install the switchbox ⇒ Electrical equipment; Rep. gr. 94 ; Switches, lights and external lamps .





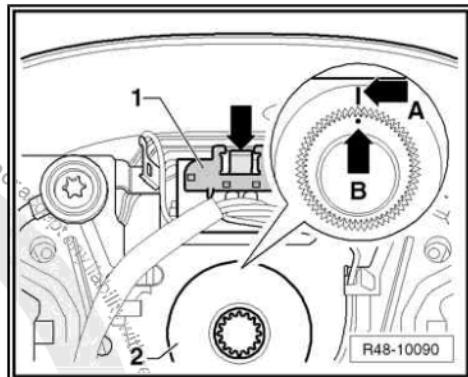
- Install the steering wheel in a way that the mark -arrow A-on the steering wheel and the mark -arrow B- on the steering column are aligned.
- Observe eventual additional marks.
- Engage the connector -1-.



**Note**

*Steering columns supplied as replacement parts have no marks.*

- Install the steering wheel [⇒ page 219](#) .



**Caution**

- ◆ *When connecting the vehicle Battery's - A- earth wire, no one should be inside the passenger compartment ⇒ Body - Internal assembly works; Rep. gr. 69 ; Safety measures for working with airbags*

#### Tightening torques

Components	Tightening torque
Steering column earth wire	$4.5 \pm 0.5 \text{ Nm}$
Steering box steering column ◆ Use a new nut (vehicles 5Z1) ⇒ <a href="#">Item 4 (page 229)</a>	$15 \text{ Nm} + 50^\circ$
◆ Use a new nut (vehicles 5Z3) ⇒ <a href="#">Item 4 (page 230)</a>	
Lower fastening of the steering column (M8 x 85) ◆ (vehicles 5Z1) ⇒ <a href="#">Item 9 (page 229)</a>	$23 \text{ Nm}$
Lower fastening of the steering column (M6 x 63) ◆ (vehicles 5Z1) ⇒ <a href="#">Item 9 (page 229)</a>	$10 \text{ Nm}$
Lower steering column fastening ◆ (vehicles 5Z3) ⇒ <a href="#">Item 2 (page 230)</a>	$8 \text{ Nm}$
Upper steering column fastening ◆ (vehicles 5Z1) ⇒ <a href="#">Item 2 (page 229)</a>	$23 \pm 2 \text{ Nm}$
◆ (vehicles 5Z3) ⇒ <a href="#">Item 6 (page 230)</a>	
Bushing support for steering column fork	$7 \text{ Nm}$

### 3.3 Steering column - check

#### Visual inspection:

- Check all steering column parts for damages.

#### Check functioning:

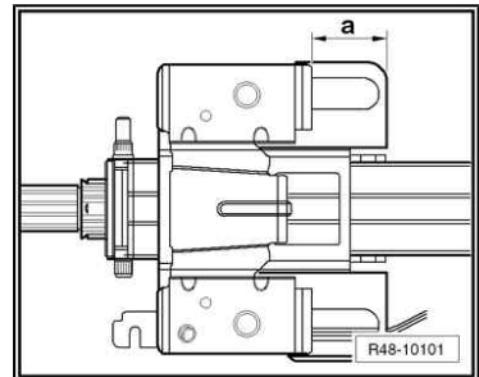
- Check if the steering wheel column turns easily and without interference.
- Check if the steering column can be adjusted for height and length.



- Check the dimension -a-.

Measurement -a-, minimum 37 mm.

- If measurement -a- is less than 37 mm, the steering wheel column is damaged and must be replaced.





## 4 Mechanical steering - repair

### 4.1 Mechanical steering wheel - assembly overview



#### WARNING

- ◆ Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Always replace corroded or rusted screws/nuts
- ◆ Repairs in the steering box are not expected. In case of complaints, the steering box must be replaced
- ◆ Welding and straightening works in the steering components are not permitted

#### 1 - Hexagonal nut

- Self-locking
- 20 Nm + 90°
- Replace once removed

#### 2 - Wheel roller bearing case

#### 3 - Mechanical steering box

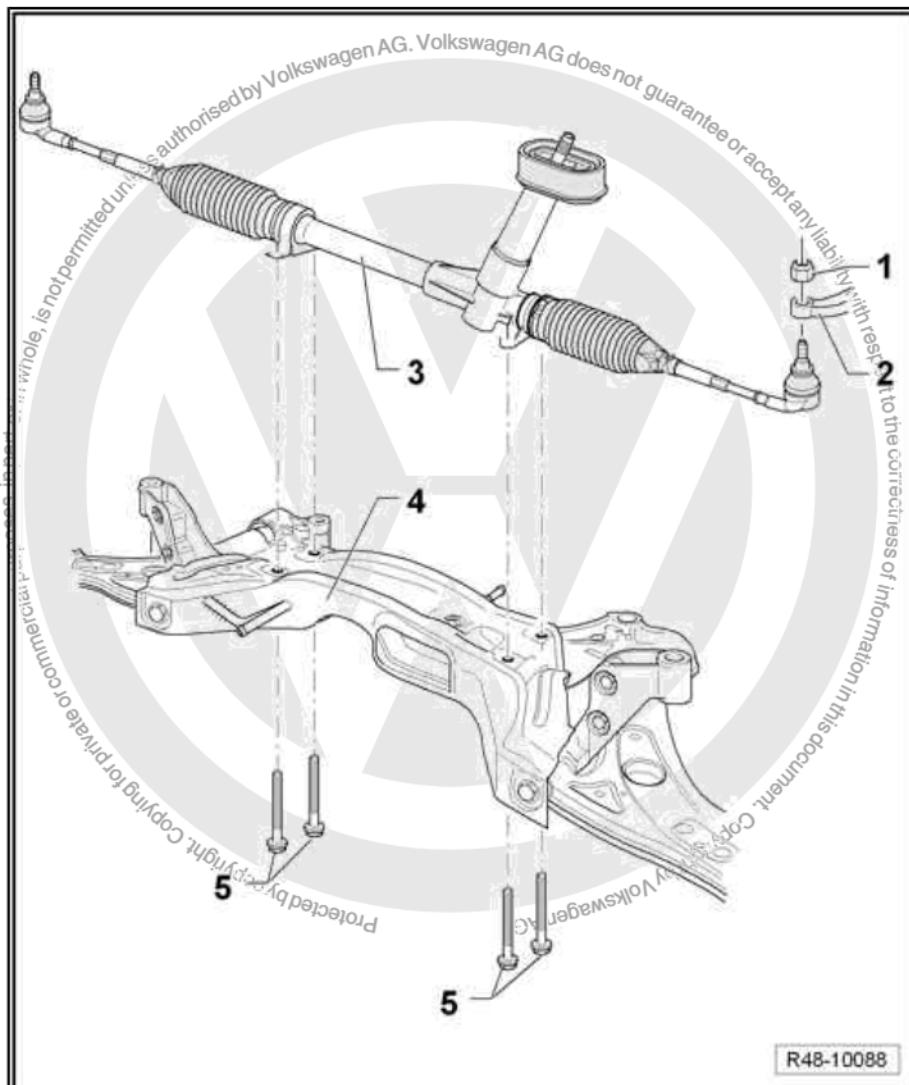
- Remove and install  
[⇒ page 241](#)

#### 4 - Auxiliary frame (assembly mounting)

- different versions
- See: [⇒ Electronic Parts Catalogue "ETKA"](#)
- Remove and install  
[⇒ page 35](#)

#### 5 - Hexagon socket head bolt

- 50 Nm + 90°
- Replace once removed





## 4.2 Mechanical steering box - remove and install

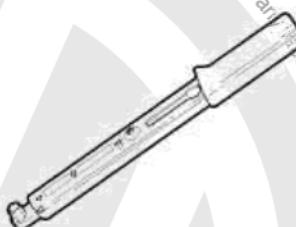


### WARNING

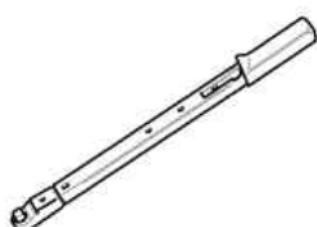
*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. ➤ page 204*

#### Special tools and workshop equipment required

VAG 1331



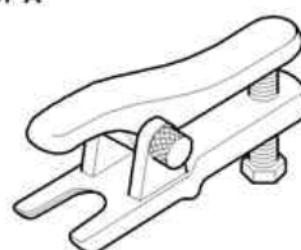
VAG 1332



VAG 1383A



3287 A



Q40-10035

- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Puller - 3287A-



#### 4.2.1 Removal



##### WARNING

*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. ⇒ page 204*

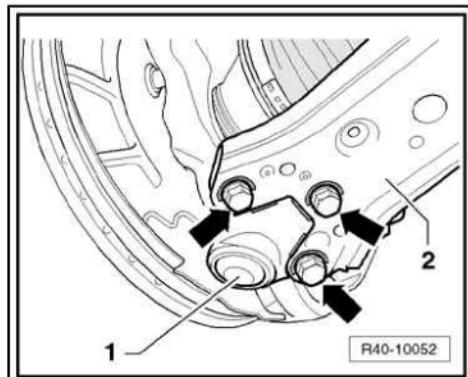
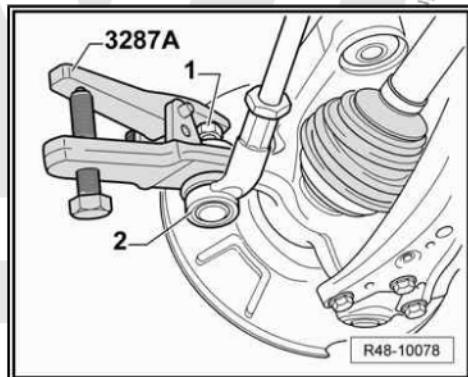
- Disconnect the Battery - A- Electrical devices; Rep. gr. 27 ; Starter, alternator, battery .
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



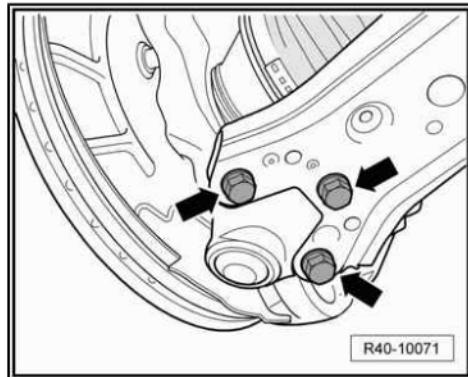
##### WARNING

*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .
- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.

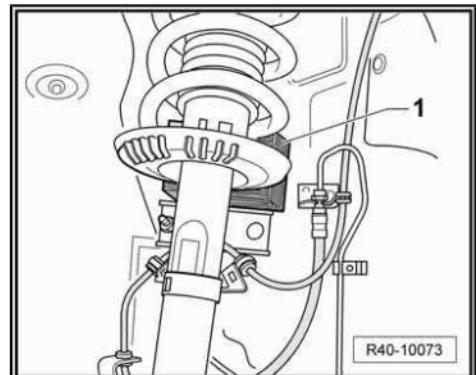


- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.

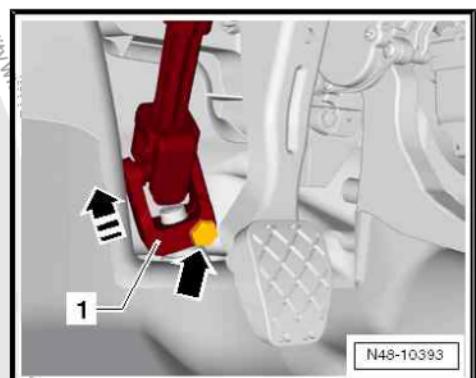




- Pull the suspension strut out and support it using a wood block -1- (for example).



- Remove the securing bolt -arrow- from the universal joint -1- and uncouple the universal joint -towards the arrow-.
- Position the auxiliary frame (assembly mounting) [⇒ page 38](#) .
- Remove the power steering box.



## 4.2.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



### WARNING

*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)*

*Always replace self-locking nuts and bolts subject to angular torque*

- ◆ Lubricate the steering box joint with lubricant such as soap, for example, before installing the steering box in its housing
- ◆ After fitting the steering box in the universal joint of the column, make sure that the joint is against the assembly plate, without twisting, and that it seals the opening for the pedal area correctly. There may be noises and/or water may come in
- ◆ Make sure that the sealing surfaces are clean
- ◆ When replacing the mechanical steering box, replace the track rod boots

Before installing the auxiliary frame (assembly mounting) bolts, position the steering box on the auxiliary frame and install the bolts for the steering box.

- Install the steering box to the auxiliary frame. Tightening torque, see [⇒ page 244](#) .
- Install the track rod to the steering arm. Tightening torque, see [⇒ page 244](#) .



**Note**

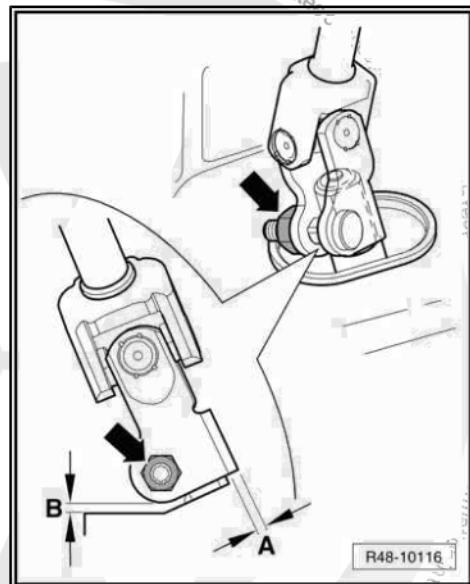
Make sure that the pressure duct does not interfere with the body and the auxiliary frame

- Install the front wheel and tighten the screws. Tightening torque, see [page 203](#).
- Install the universal joint on the steering box pinion.

**Note**

Measurement -A- should be parallel to the steering box pinion axle and measurement -B- should be the minimal in order not to interfere with the lining.

- Tighten the union nut -arrow-. Tightening torque, see [page 244](#).
- Check alignment [page 204](#).



**Tightening torques**

Components	Tightening torque
Steering terminal to the wheel roller bearing case <ul style="list-style-type: none"><li>◆ Use new fastening nuts</li></ul>	20 Nm + 90°
Coupling rod to anti-roll bar <ul style="list-style-type: none"><li>◆ Use new fastening nuts</li></ul>	40 Nm
Swivel joint to wishbone <ul style="list-style-type: none"><li>◆ Use new fastening screws</li></ul>	20 Nm + 90°
Steering box steering column <ul style="list-style-type: none"><li>◆ Use new securing nuts (vehicles 5Z1) <a href="#">Item 4 (page 222)</a></li><li>◆ Use new securing nuts (vehicles 5Z3) <a href="#">Item 4 (page 223)</a></li></ul>	15 Nm + 50°
Steering box to auxiliary frame <ul style="list-style-type: none"><li>◆ Use new fastening screws</li></ul>	50 Nm + 90°

#### 4.3 Mechanical steering box - disassemble and assemble

**Note**

- ◆ Welding or straightening works are not permitted on the steering components.
- ◆ Replace self-locking nuts and bolts subject to angular torque.



1 - Direction terminal of the connection rod (right side)

- Marked with "C"  
[⇒ page 248](#)
- Check [⇒ page 247](#).
- Observe the assembly position [⇒ page 248](#).

2 - Hexagonal nut

- $50 \pm 5$  Nm

3 - Clamp

4 - Folding boot

- Must not be twisted after adjusting the alignment
- Remove the steering box to replace it
- Assemble [⇒ page 247](#)

5 - Clamp

- Fasten [⇒ page 247](#).
- Replace - open with pliers

6 - Track rod (right side)

- $80 \pm 8$  Nm
- Remove and install [⇒ page 246](#)

7 - Clamp with nuts

- Replace if threads are damaged

8 - Rubber bearing

9 - Mechanical steering box

- Remove and install [⇒ page 241](#)

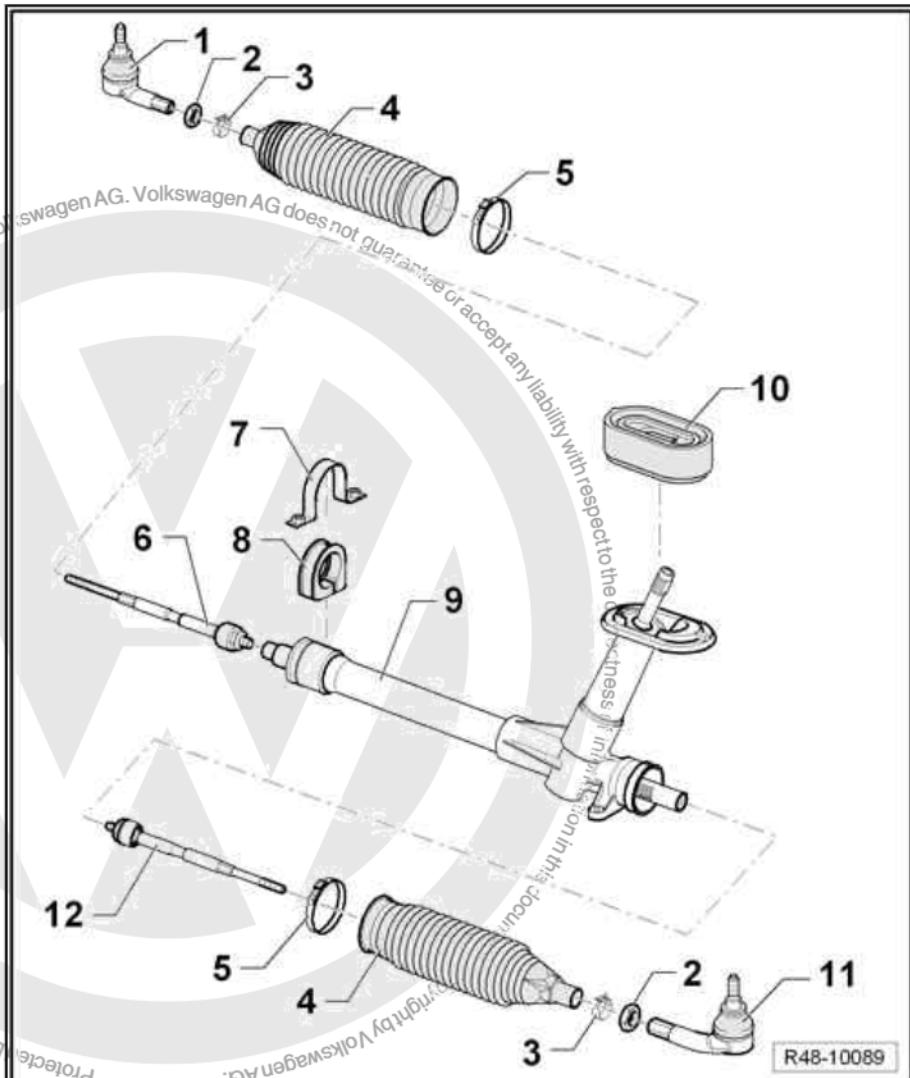
10 - Gasket

11 - Track rod steering linkage (left side)

- Marked with "D" [⇒ page 248](#)
- Check [⇒ page 247](#).
- Observe the assembly position [⇒ page 248](#).

12 - Track rod (left side)

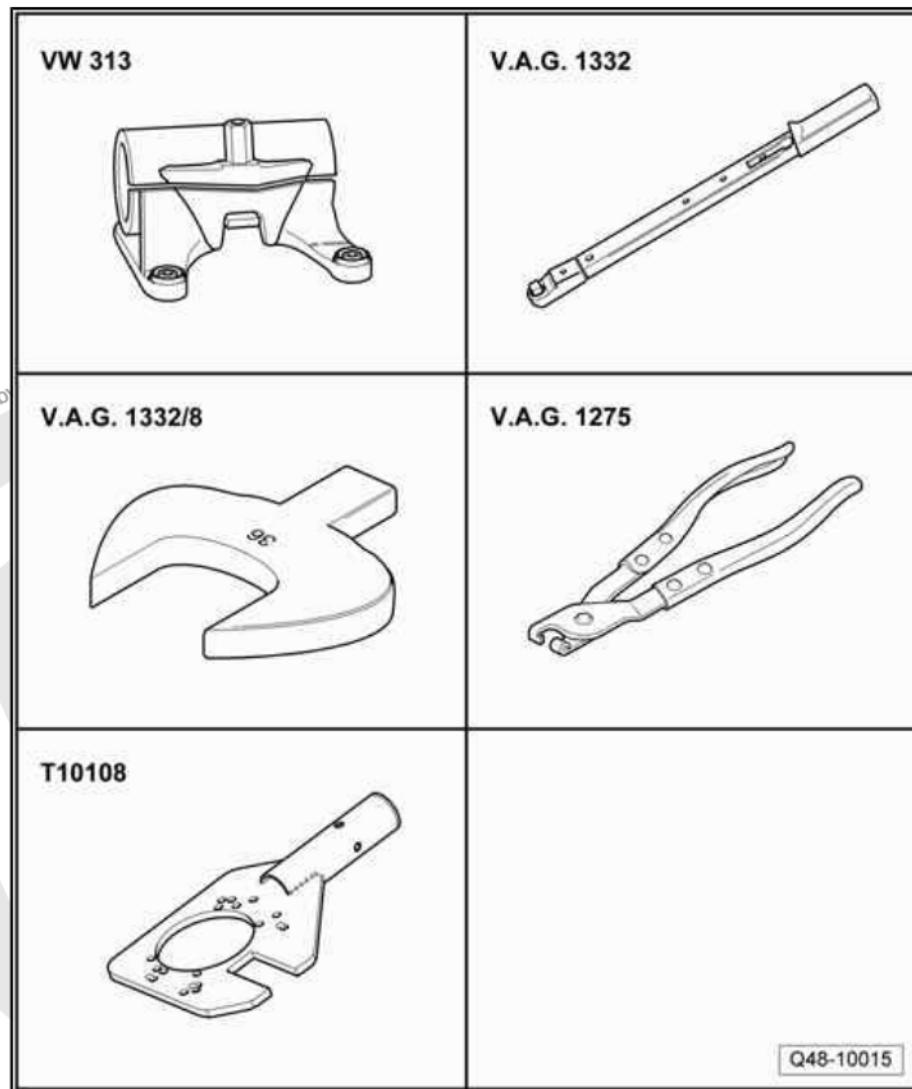
- $80 \pm 8$  Nm
- Remove and install [⇒ page 246](#)





#### 4.3.1 Track rods - remove and install

Special tools and workshop equipment required



- ◆ Support for VW643 or VW 643/1 - VW 313-
- ◆ Torque wrench - 40 to 200 Nm (1/2" drive) - VAG 1332-
- ◆ Wrench insert 36 - VAG 1332/8-
- ◆ Clamp pliers or VW 004V - VAG 1275-
- ◆ Gearbox support - T 10108-

Removal:



Note

*The track rods can only be removed and installed with the steering box removed.*

- Remove the mechanical steering box [page 244](#) .
- Externally clean the steering box at the folding boot area.
- Open the tightening clamp and push the boot backward.



- Fasten the steering box to the Gearbox support - T 10108- and loosen the track rod -1- from the rack -2-.

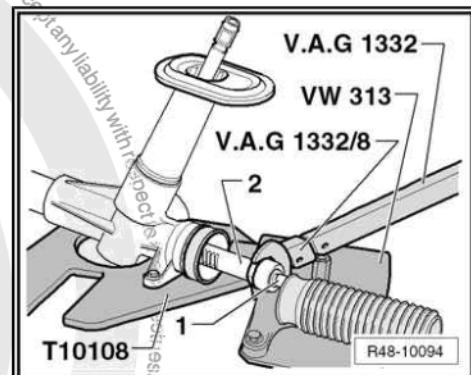
#### Installation:

Installation is performed in reverse to removal sequence.

To fasten the steering box, use the hole "5" and the respective hole on the opposite side, at the gearbox support.

#### Tightening torque:

Track rod to steering box  $80 \pm 8 \text{ Nm}$



### 4.3.2 Folding boot - assembly

Special tools and workshop equipment required

- ◆ Clamp pliers or VW 004V - VAG 1275-



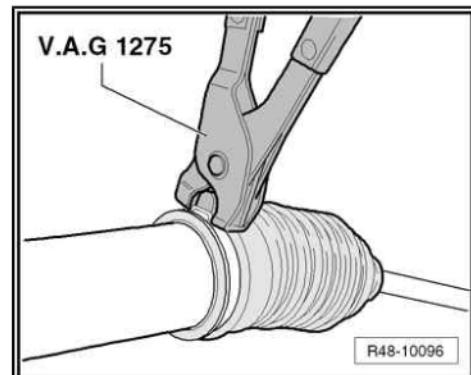
#### Assembly:

- Check the protective boot for wearing (tears, cracks) and make sure that the sealing surfaces are clean.
- When installing the protective boot, turn the track rod first so that the bar ball pin gets in the installation position.
- Fasten the clamp with the help of the Clamp pliers or VW 004V - VAG 1275- .



#### Note

- ◆ Use only original clamps
- ◆ Under no circumstances shall the protective boots be installed twisted (misaligned).



### 4.3.3 Clearance, fastening and protective boots for track rod terminals - check

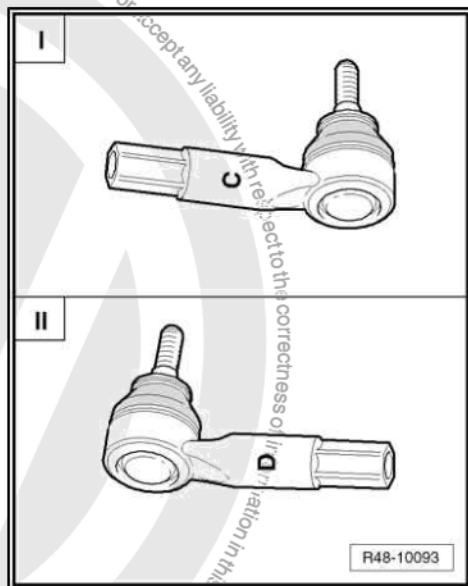
- With the vehicle raised (wheels hanging freely), check the clearance by moving the track rods and the wheels. Clearance: no clearance.
- Check tightness.
- Check the sealing boots for damages and correct fitting.



#### 4.3.4 Correspondence of track rod terminals

I - Right track rod terminal is marked with -C- .

II - Left track rod terminal is marked with -D- .

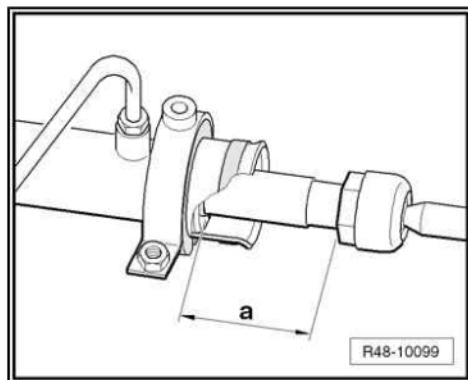


#### 4.3.5 Centre steering rack position - determine

Before proceeding with assembly of the power steering box, the rack must be placed at the central position

- Move the steering rack to the position where the distance -a- is reached.

Dimension -a- = 68.5 mm





## 5 Power steering box - repair

### 5.1 Power steering - assembly overview



#### WARNING

- ◆ Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Always replace corroded or rusted screws/nuts
- ◆ Repairs in the steering box are not expected. In case of complaints, the steering box must be replaced
- ◆ Welding and straightening works in the steering components are not permitted

1 - Bolts  
 8 Nm

2 - Heat shield  
 Only for some markets  
 Refer to ⇒ Electronic Parts Catalogue "ETKA"

3 - Seal  
 Replace once removed

4 - Hexagonal nut  
 Self-locking  
 20 Nm + 90°  
 Replace once removed

5 - Wheel roller bearing case

6 - Pressure hose

7 - Hollow bolt  
 38 ± 4 Nm

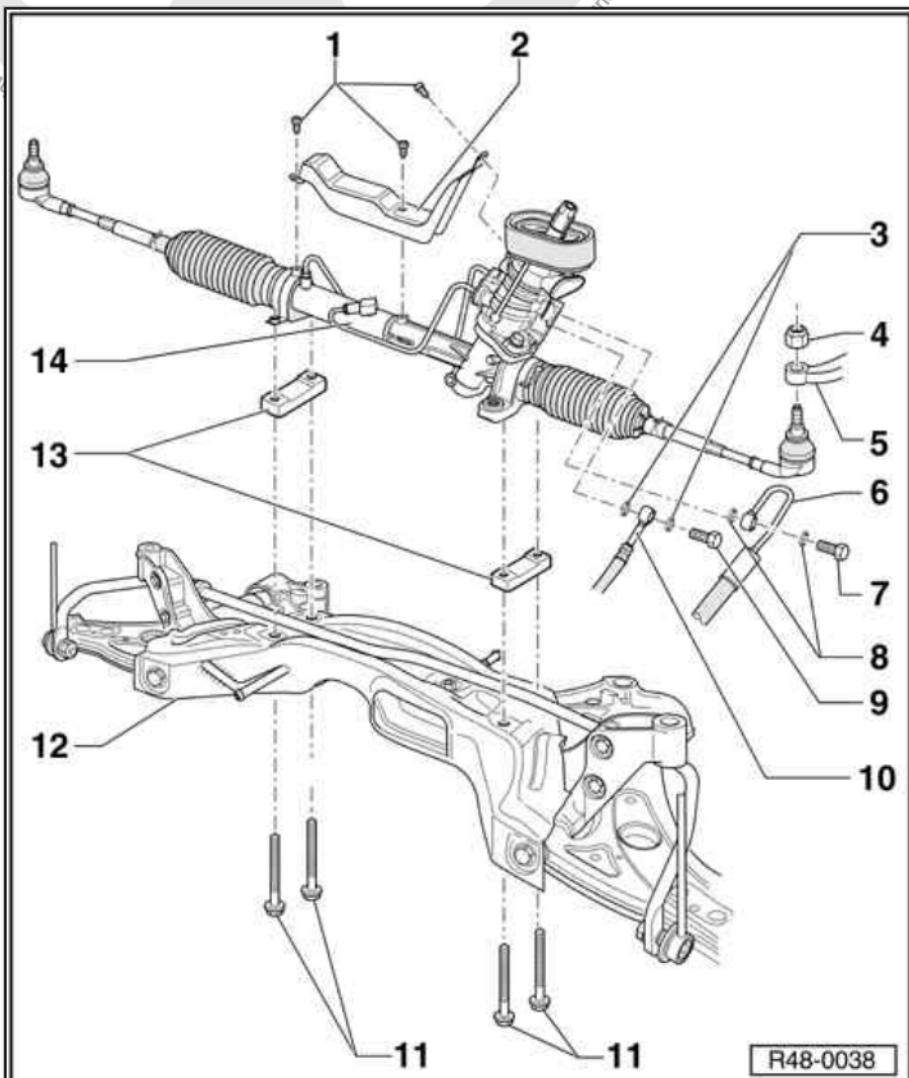
8 - Seal  
 Replace once removed

9 - Hollow bolt  
 38 ± 4 Nm

10 - Return hose

11 - Hexagonal bolt  
 50 Nm + 90°  
 Replace once removed

12 - Auxiliary frame (assembly mounting)  
 different versions  
 Refer to ⇒ Electronic Parts Catalogue "ETKA"



R48-0038



Remove and install [page 35](#)

13 - Spacer

For version Crossfox only

14 - Power steering box

Remove and install [page 250](#)

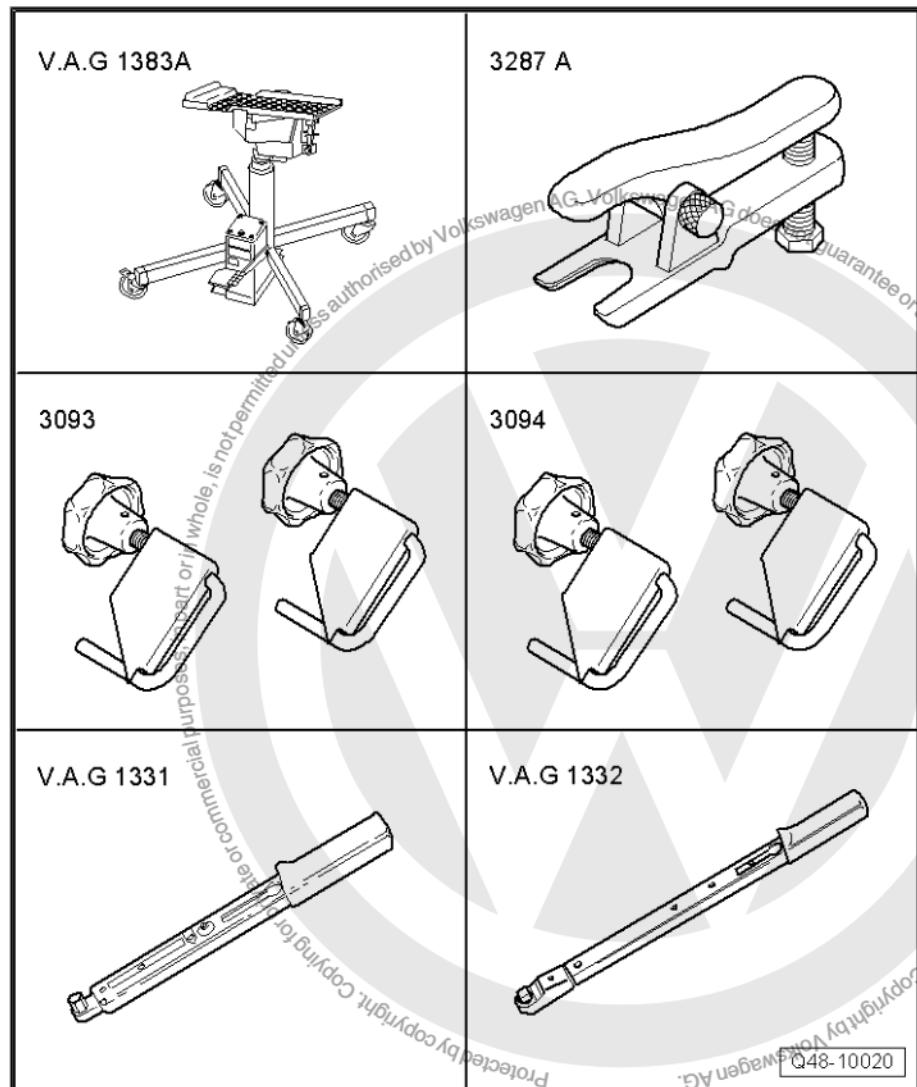
## 5.2 Power steering box - remove and install



### WARNING

*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [page 204](#)*

Special tools and workshop equipment required



- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Puller - 3287A-
- ◆ Clamps (diameter 40 mm) - 3093-



- ◆ Clamps (diameter 25 mm) - 3094-
- ◆ Torque wrench - 5 to 50 Nm (fit. 1/2") - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2") - VAG 1332-

### 5.2.1 Notes related to installation works in the power steering box



#### WARNING

- ◆ Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)

- ◆ On works to be performed on the power steering box, it is necessary to follow strict cleaning measures.
- ◆ Carefully clean the threaded joints and the surrounding area before loosening them.
- ◆ Place the parts removed over a clean base and cover them if the repair is not performed immediately.
- ◆ Do not use cloths that lint.
- ◆ Remove the replacement parts from the package only when proceeding with the installation.
- ◆ Use only original parts

### 5.2.2 Removal



#### WARNING

- ◆ Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)

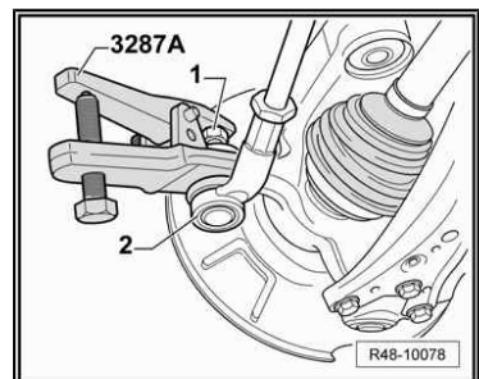
- Disconnect the Battery - A- ⇒ Electrical devices; Rep. gr. 27 ; Starter, alternator, battery .
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the front wheel.
- Loosen the hexagonal nut -1- from the steering terminal.



#### WARNING

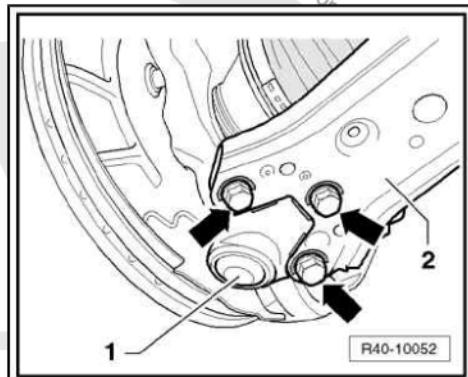
To protect the thread, leave the nut screwed a few turns at the steering terminal.

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A - .

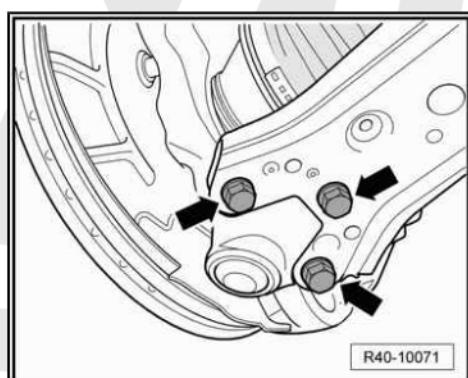




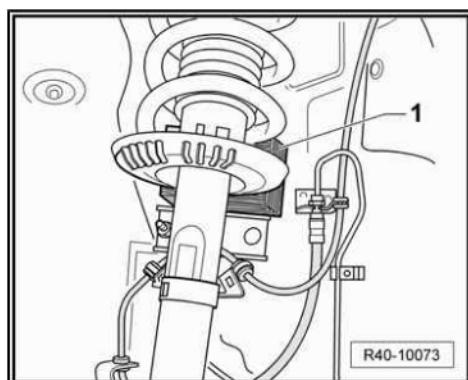
- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



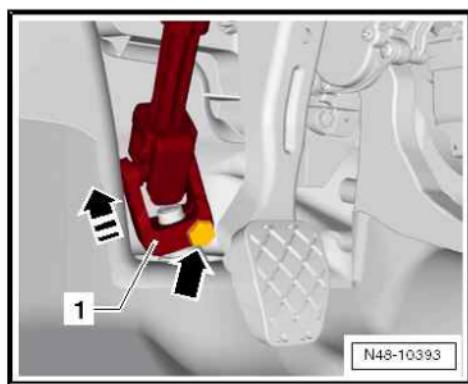
- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.



- Pull the suspension strut out and support it using a wood block -1- (for example).

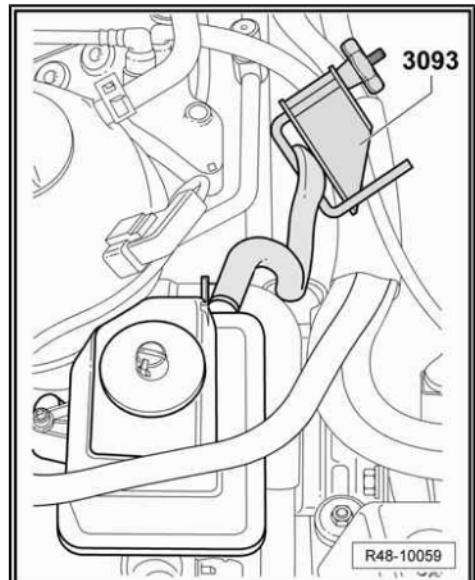


- Remove the securing bolt -arrow- from the universal joint -1- and uncouple the universal joint -towards the arrow-.

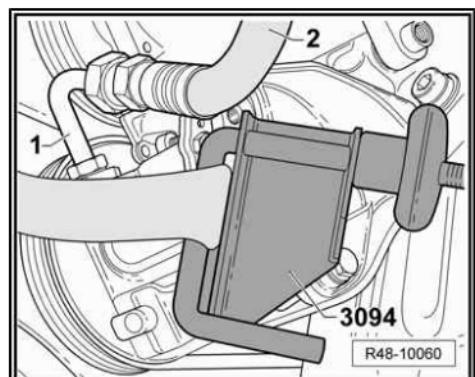




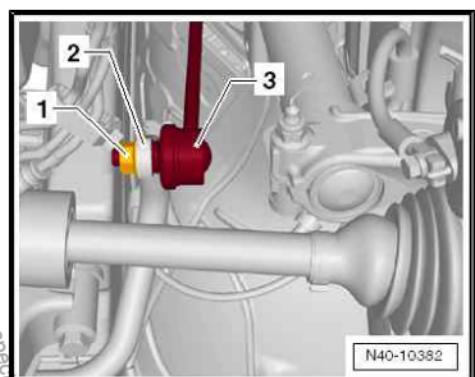
- Release the flexible tube from the transmission cylinder tank, removing it by using the Clamps (diam. 40 mm) - 3093- .



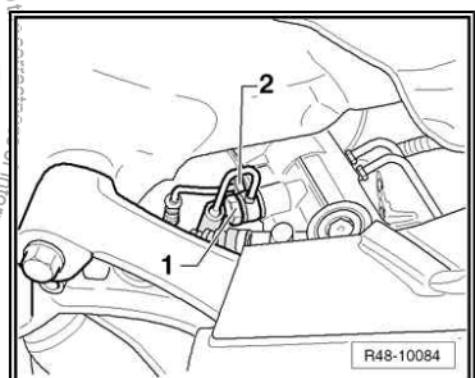
- Release the flexible tube from the pump removing the Clamps (diam. 25 mm) - 3094- .



- Release the hex nut -1- from the stabilizer rod in both sides.
- Remove the rods -3- from anti-roll bar -2-.

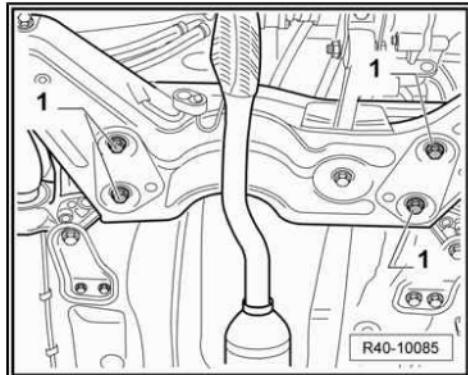


- Remove the connection bolt -1- for the steering box pressure duct.
- Remove the connection bolt -2- for the steering box return duct.
- Seal the ducts with a plastic bag and adhesive tape.
- Seal power steering box threaded holes with plastic sealing plugs.





- Loosen the fastening bolts -1- for the steering box to auxiliary frame and fasten it to the body (using wire, for example).
- Position the auxiliary frame (assembly mounting) [⇒ page 38](#).
- Remove the power steering box.



### 5.2.3 Installation

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)*

*Always replace self-locking nuts and bolts subject to angular torque*

- ◆ Use new sealants for the hoses/ducts
- ◆ Lubricate the steering box joint with lubricant such as soap, for example, before installing the steering box in its housing
- ◆ After fitting the steering box in the universal joint of the column, make sure that the joint is against the assembly plate, without twisting, and that it seals the opening for the pedal area correctly. There may be noises and/or water may come in
- ◆ Make sure that the sealing surfaces are clean
- ◆ When replacing the power steering box, replace the track rod boots

Before installing the auxiliary frame bolts, position the steering box on the auxiliary frame and install the bolts for the steering box.

- Install the steering box to the auxiliary frame. Tightening torque, see [⇒ page 255](#).
- Install the track rod to the steering arm. Tightening torque, see [⇒ page 255](#).
- Install the return hose and tighten the connecting bolt.



#### Note

*Make sure that the pressure duct does not interfere with the body and the auxiliary frame*

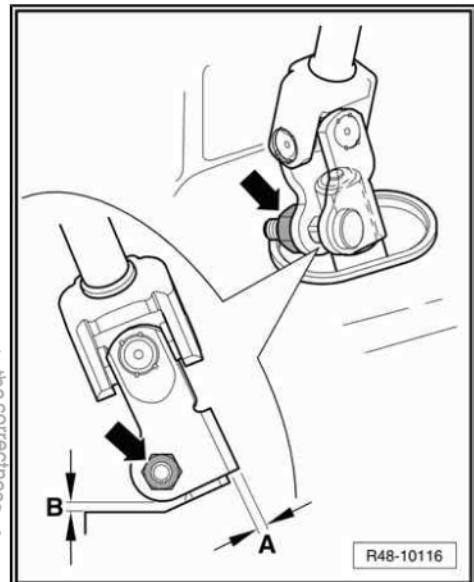
- Install the wheels and tighten the securing bolts [⇒ page 203](#).
- Install the universal joint on the steering box pinion.



**Note**

*Measurement -A- should be parallel to the steering box pinion axle and measurement -B- should be the minimal in order not to interfere with the lining.*

- Tighten the union nut -arrow-. Tightening torque, see [⇒ page 255](#).
- Replenish the hydraulic oil level [⇒ page 280](#).
- Check alignment [⇒ page 204](#).



**Tightening torques**

Components	Tightening torque
Steering terminal to the wheel roller bearing case ◆ Use new fastening nuts	20 Nm + 90°
Coupling rod to anti-roll bar ◆ Use new fastening nuts	40 Nm
Swivel joint to wishbone ◆ Use new fastening screws	20 Nm + 90°
Steering box steering column ◆ Use new securing nuts (vehicles 5Z1) <a href="#">⇒ Item 4 (page 222)</a> ◆ Use new securing nuts (vehicles 5Z3) <a href="#">⇒ Item 4 (page 223)</a>	15 Nm + 50°
Steering box to the auxiliary frame (sub-frame) ◆ Use new fastening screws	50 Nm + 90°

### 5.3 Power steering box - disassemble and assemble



**Note**

- ◆ *Welding or straightening works are not permitted on the steering components.*
- ◆ *Replace self-locking nuts and bolts subject to angular torque.*
- ◆ *Type of oil: Hydraulic oil - 325.029.011-. Refer to the ⇒ Chemicals Manual or ⇒ Electronic Parts Catalogue "ETKA"*
- ◆ *Amount of oil in the system: 0,7 ... 0,9 l.*



1 - Direction terminal of the connection rod (right side)

- Marked with "C"  
[⇒ page 259](#)
- Check [⇒ page 259](#) .
- Observe the assembly position [⇒ page 259](#) .

2 - Hexagonal nut

- $50 \pm 5 \text{ Nm}$

3 - Clamp

4 - Folding boot

- Must not be twisted after adjusting the alignment
- Remove the steering box to replace it
- Assemble [⇒ page 258](#)

5 - Clamp

- Fasten [⇒ page 258](#) .
- Replace - open with pliers

6 - Gasket

7 - Track rod steering linkage (left side)

- Marked with "D"  
[⇒ page 259](#)
- Check [⇒ page 259](#) .
- Observe the assembly position [⇒ page 259](#) .

8 - Hexagonal nut

- $50 \pm 5 \text{ Nm}$

9 - Clamp

10 - Folding boot

- Must not be twisted after adjusting the alignment
- Remove the steering box to replace it
- Assemble [⇒ page 258](#)

11 - Clamp

- Fasten [⇒ page 258](#) .
- Replace - open with pliers

12 - Track rod (right side)

- Is supplied along with the steering box as a replacement part
- $80 \pm 8 \text{ Nm}$

13 - Power steering box

- Remove and install [⇒ page 250](#)

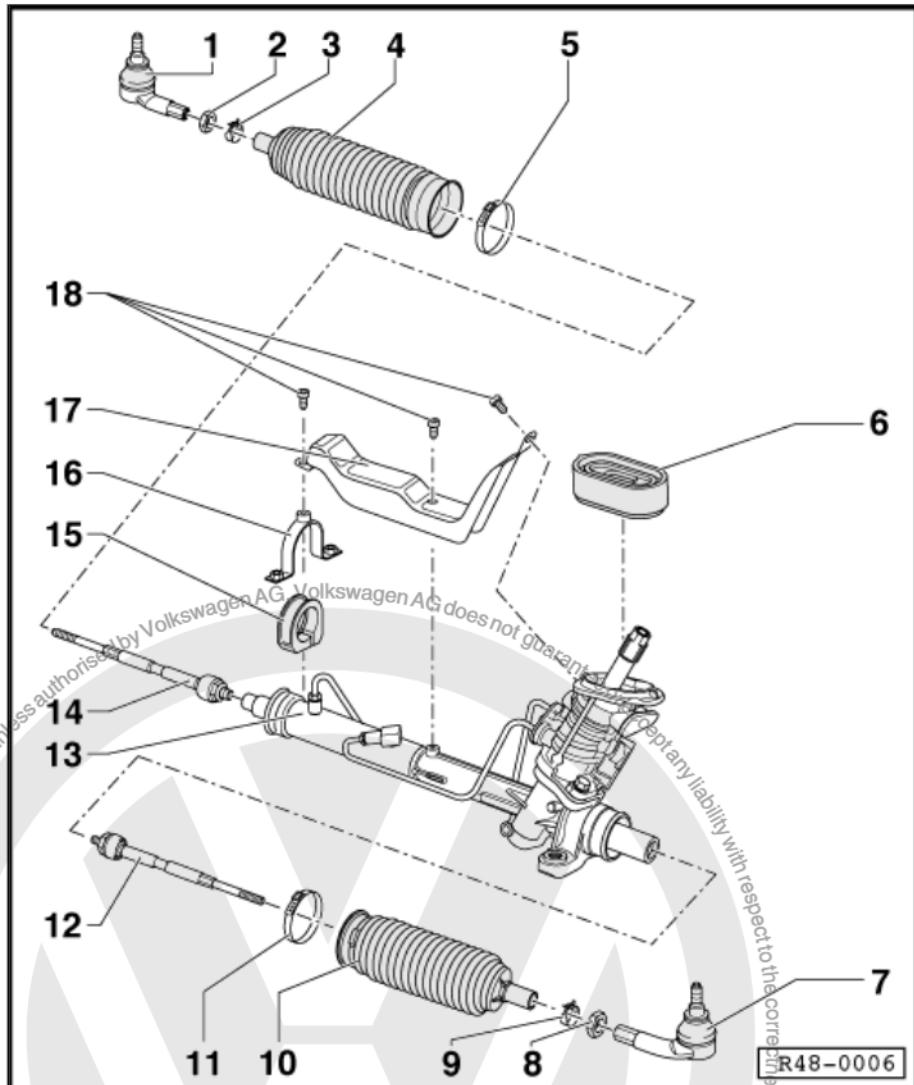
14 - Track rod (left side)

- Is supplied along with the steering box as a replacement part
- $80 \pm 8 \text{ Nm}$

15 - Rubber bearing

16 - Clamp with nuts

- Replace if threads are damaged





17 - Heat shield

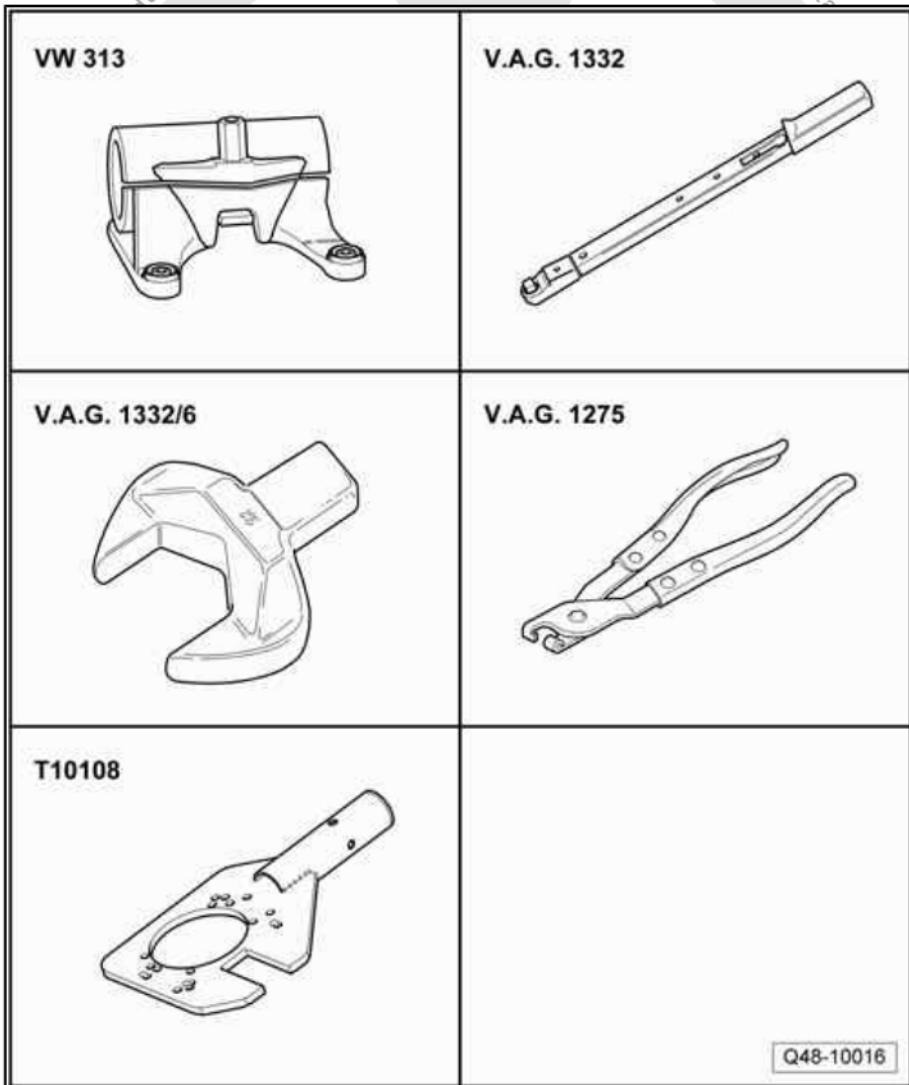
- Only for some markets
- See: ⇒ Electronic parts catalogue "ETKA"

18 - Screw

- 8 Nm

5.3.1      Track rod - remove and install

Special tools and workshop equipment required



- ◆ Support for VW 643 or VW 643/1 - VW 313-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2") - VAG 1332-
- ◆ Wrench insert 32 - VAG 1332/6-
- ◆ Clamp pliers or VW 004V - VAG 1275-
- ◆ Gearbox support - T10108-



Removal:



Note

*The track rods can only be removed and installed with the steering box removed.*

- Remove the power steering box [page 250](#) .
- Close the steering box pipes if this has not been done yet.
- Externally clean the steering box at the folding boot area.

To disassemble the right track rod, open the left boot tightening clamp and push the boot backward, as it is necessary to press against the left steering rack to release the right track rod.

- Open the tightening clamp and push the boot backward.
- Fasten the steering box to the Gearbox support - T10108- and unscrew the track rod -1- from the rack -2-.

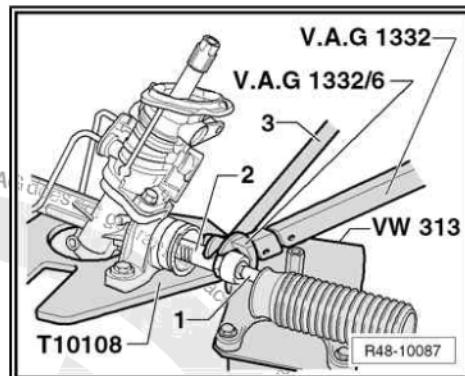
Installation:

Installation is performed in reverse to removal sequence.

To fasten the steering box, use the hole "5" and the proper gearbox support hole, located on the front.

Tightening torque:

Track rod to steering box 80 ± 8 Nm



### 5.3.2 Folding boot - assembly

Special tools and workshop equipment required

- ◆ Clamp pliers or VW 004V - VAG 1275-



Assembly:

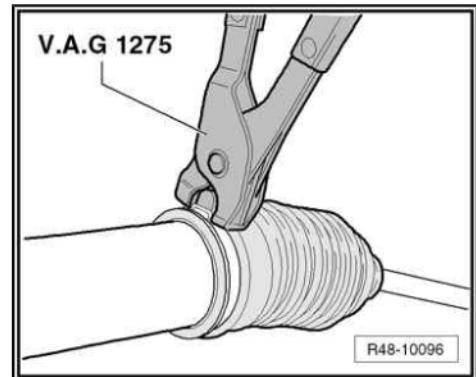
- Check the protective boot for wearing (tears, cracks) and make sure that the sealing surfaces are clean.



- When installing the protective boot, turn the track rod first so that the bar ball pin gets in the installation position.
- Fasten the clamp with the help of the Clamp pliers or VW 004V - VAG 1275-



- ◆ Use only original clamps
- ◆ Under no circumstances shall the protective boots be installed twisted (misaligned).



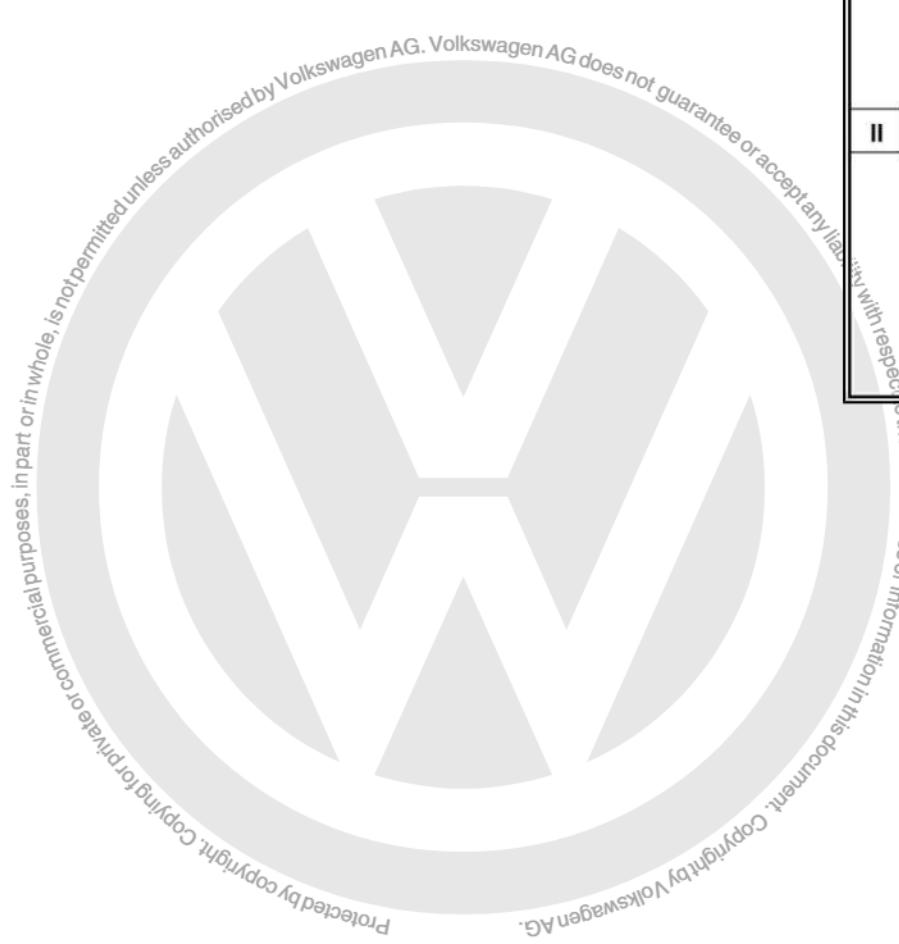
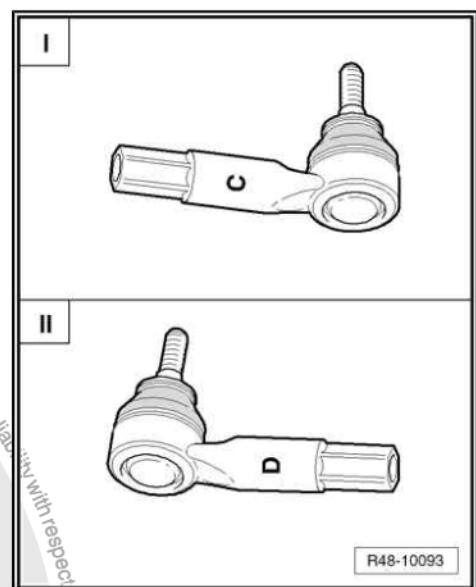
### 5.3.3 Clearance, fastening and protective boots for track rod terminals - check

- With the vehicle raised (wheels hanging freely), check the clearance by moving the track rods and the wheels. Clearance: no clearance.
- Check tightness.
- Check the sealing boots for damages and correct fitting.

### 5.3.4 Correspondence of track rod terminals

I - Right track rod terminal is marked with -C- .

II - Left track rod terminal is marked with -D- .



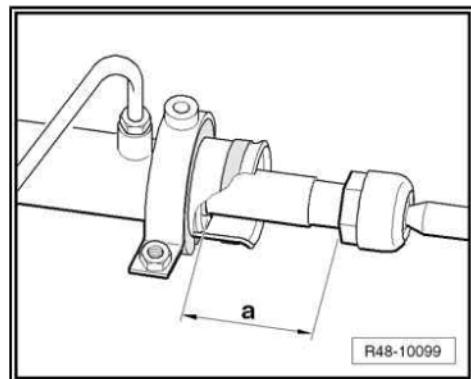


### 5.3.5 Centre steering rack position - determine

Before proceeding with assembly of the power steering box, the rack must be placed at the central position.

- Move the steering rack to the position where the distance -a- is reached.

Dimension -a- = 75.5 mm





## 6 Hydraulic pump, compensation reservoir, hydraulic pipes (power steering)



### WARNING

*Replace self-locking nuts and bolts subject to angular torque.*

#### 6.1 Hydraulic pump with hydraulic tubes - assembly overview

I - Vehicles with hydraulic pump installed on the upper section

II - Vehicles with hydraulic pump installed on the lower section

Illustrative figure, valid for all models:

1 - Expansion tank

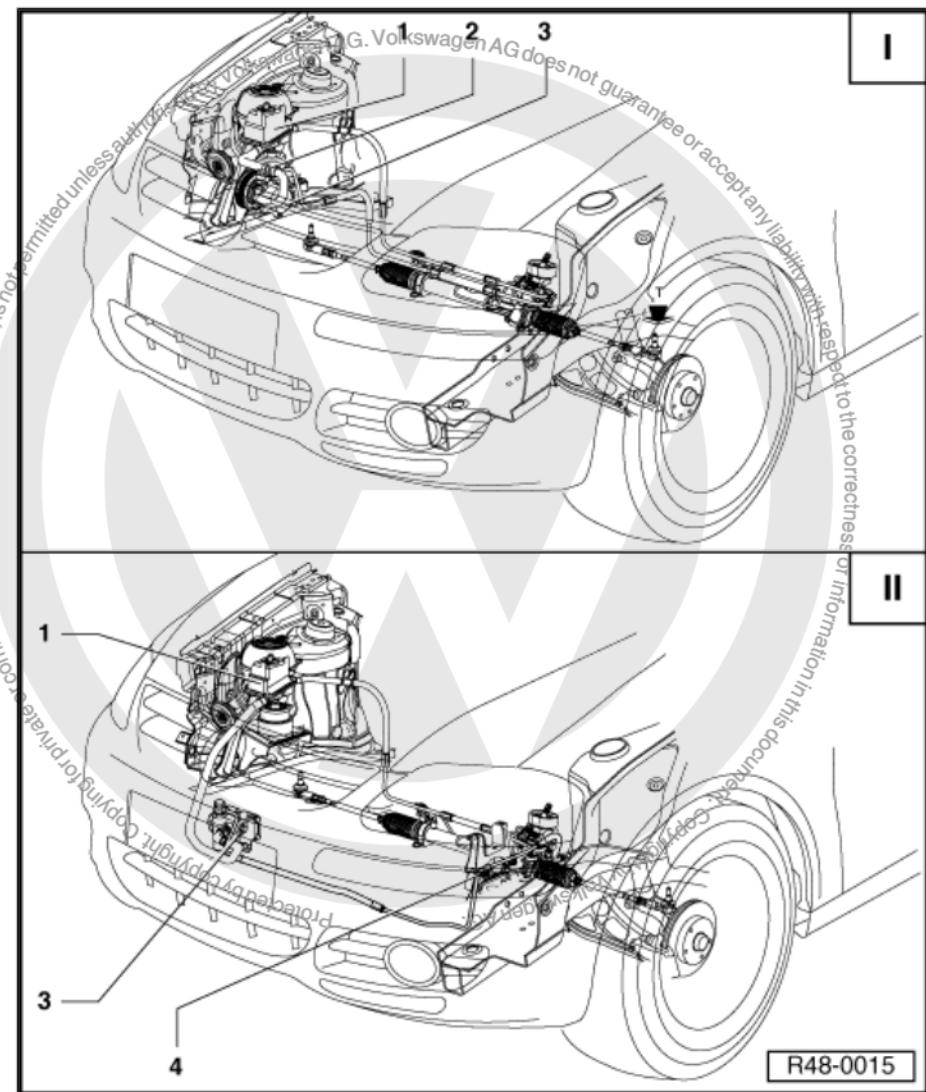
- Assembly overview  
⇒ [page 262](#)

2 - Fastening the return pipes to the pressure tubes

3 - Hydraulic pump

- Operating pressure - check ⇒ [page 273](#) .

4 - Fastening the pressure tubes to the gearbox





### 6.1.1 Compensation reservoir - assembly overview

1 - Reservoir lid with measurement rod

- ◆ Oil level: between the minimum and maximum marks; engine temperature approx. 50 °C
- ◆ Arrow A: oil level with cold engine
- ◆ With cold engine, the oil level cannot exceed the minimum mark.
- ◆ Check the oil level with the reservoir lid installed
- ◆ Open the reservoir lid with, for example, a lever

2 - Clamp

- Install the clamp at most on the hose to the transverse mark.
- The clamp fastening eyelets shall be facing upwards.
- See: ⇒ Electronic parts catalogue "ETKA"

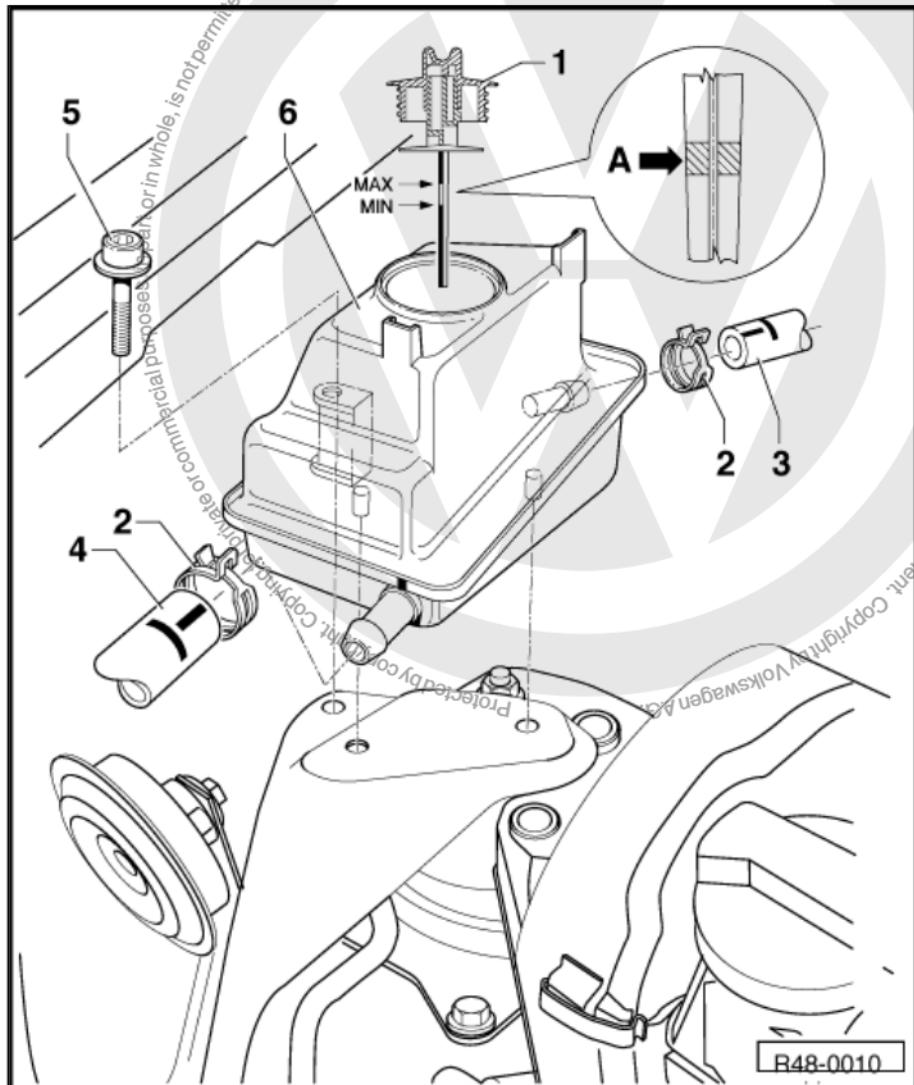
3 - Flexible return tube

4 - Flexible aspiration tube

5 - Internal hex head bolt

- 10 ± 1 Nm

6 - Expansion tank





## 6.1.2 Pressure tubes and fastening the flexible aspiration tube on vehicles with air-conditioning

### 1 - Hydraulic pump

- Operating pressure - check [page 273](#).

### 2 - Hollow bolt

- $38 \pm 4 \text{ Nm}$

### 3 - Seal

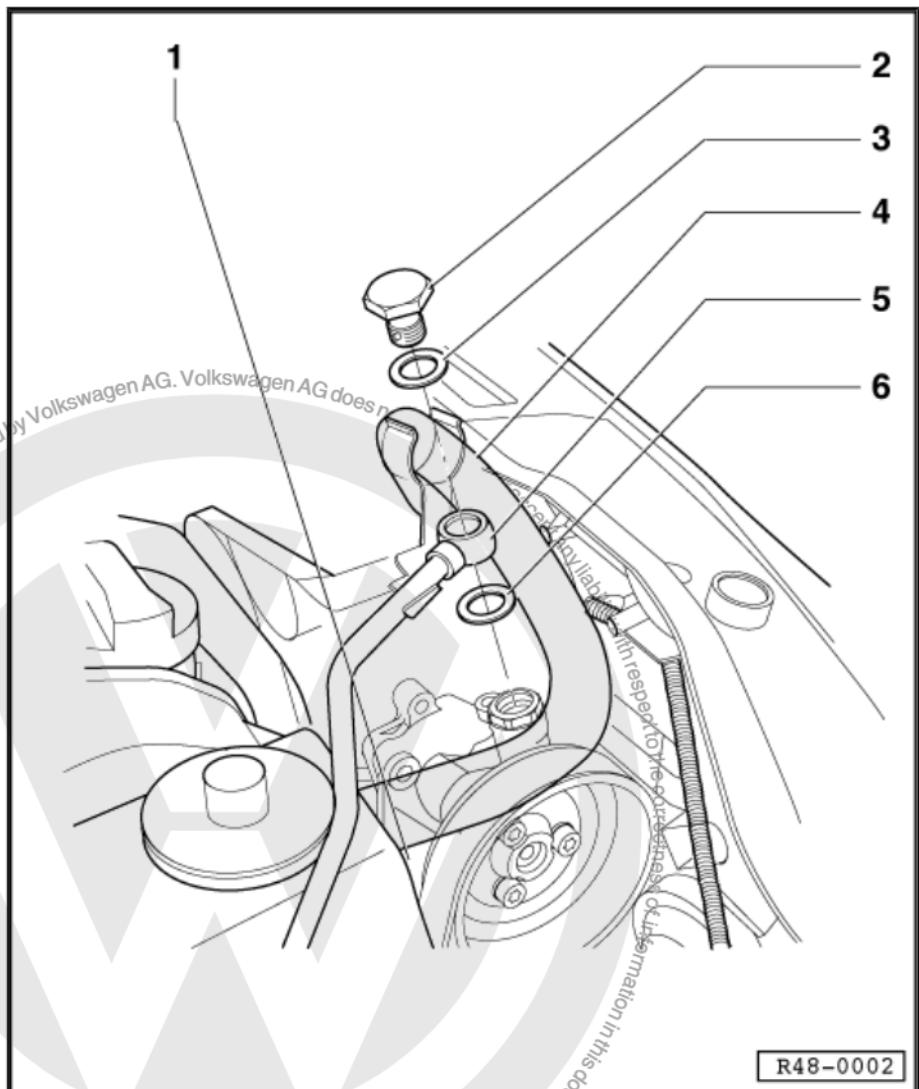
- Replace once removed

### 4 - Suction tubes

### 5 - Pressure tubes

### 6 - Seal

- Replace once removed





### 6.1.3 Pressure tubes and fastening the flexible aspiration tube on vehicles without air-conditioning

#### 1 - Hydraulic pump

- Operating pressure - check [page 273](#).

#### 2 - Flexible suction tube

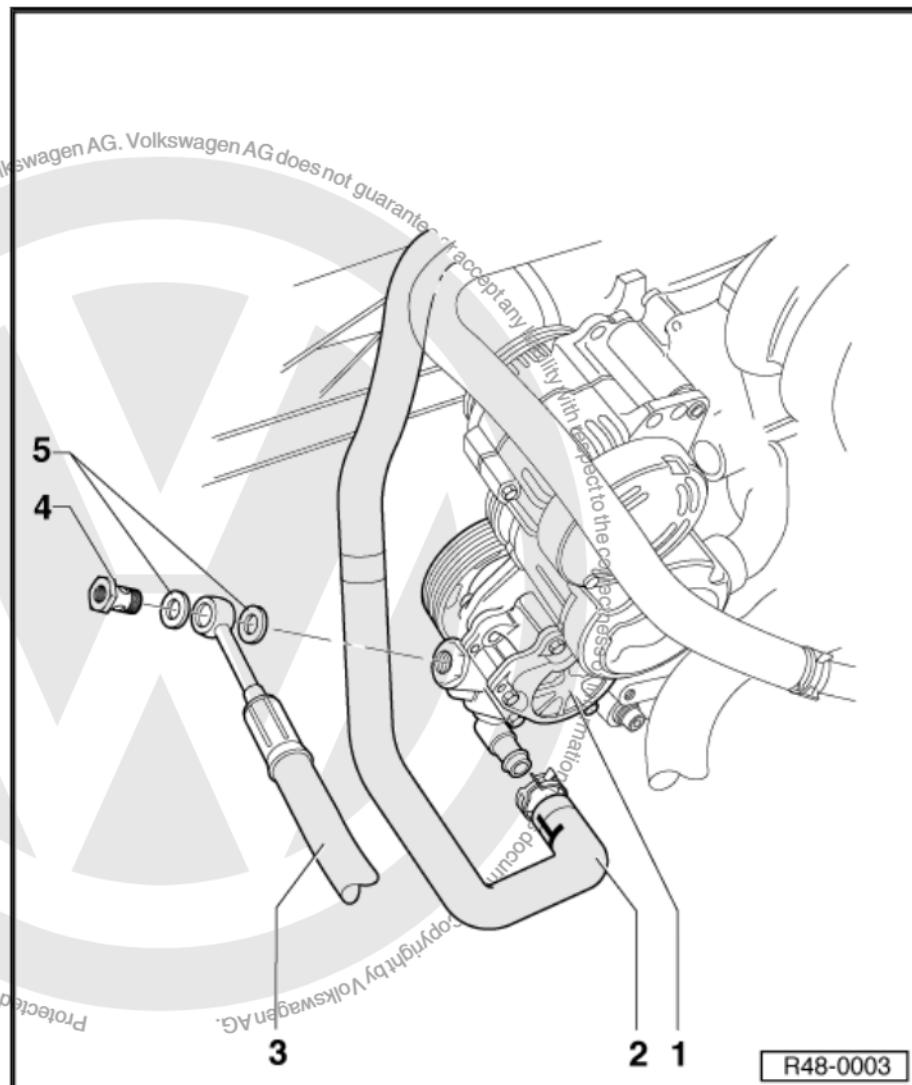
#### 3 - Pressure tubes

#### 4 - Hollow bolt

- $38 \pm 4$  Nm

#### 5 - Seals

- Replace once removed





## 6.2 Hydraulic pump installed on the lower section - assembly overview

### 1 - Mounting bracket

- Remove and install ⇒ Heating, air conditioning; Rep. gr. 87 ; Heating

### 2 - Hollow bolt

- $38 \pm 4$  Nm

### 3 - Pressure tubes

### 4 - Seals

- Replace once removed

### 5 - Suction tubes

### 6 - Clamp

- See: ⇒ Electronic parts catalogue "ETKA"

### 7 - Hydraulic pump

- Operating pressure - check ⇒ [page 273](#).

### 8 - Screw

- $23 \pm 2.3$  Nm

- Replace once removed

### 9 - Poly-V belt pulley

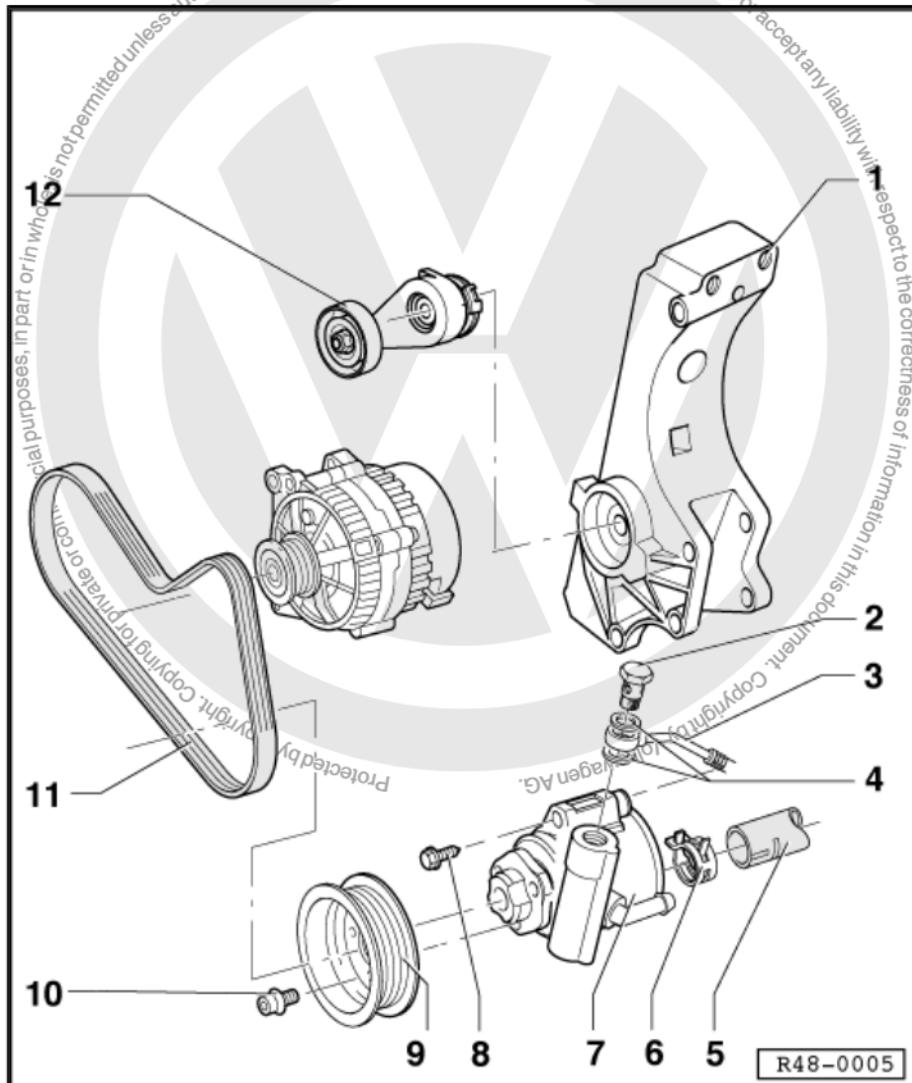
### 10 - Screw

- $23 \pm 2.3$  Nm

- Refer to ⇒ Electronic Parts Catalogue "ETKA"

### 11 - Poly-V belt

### 12 - Tensioning element for Poly-V belt



R48-0005

## 6.3 Vehicles with hydraulic pump installed on the lower section - remove and install

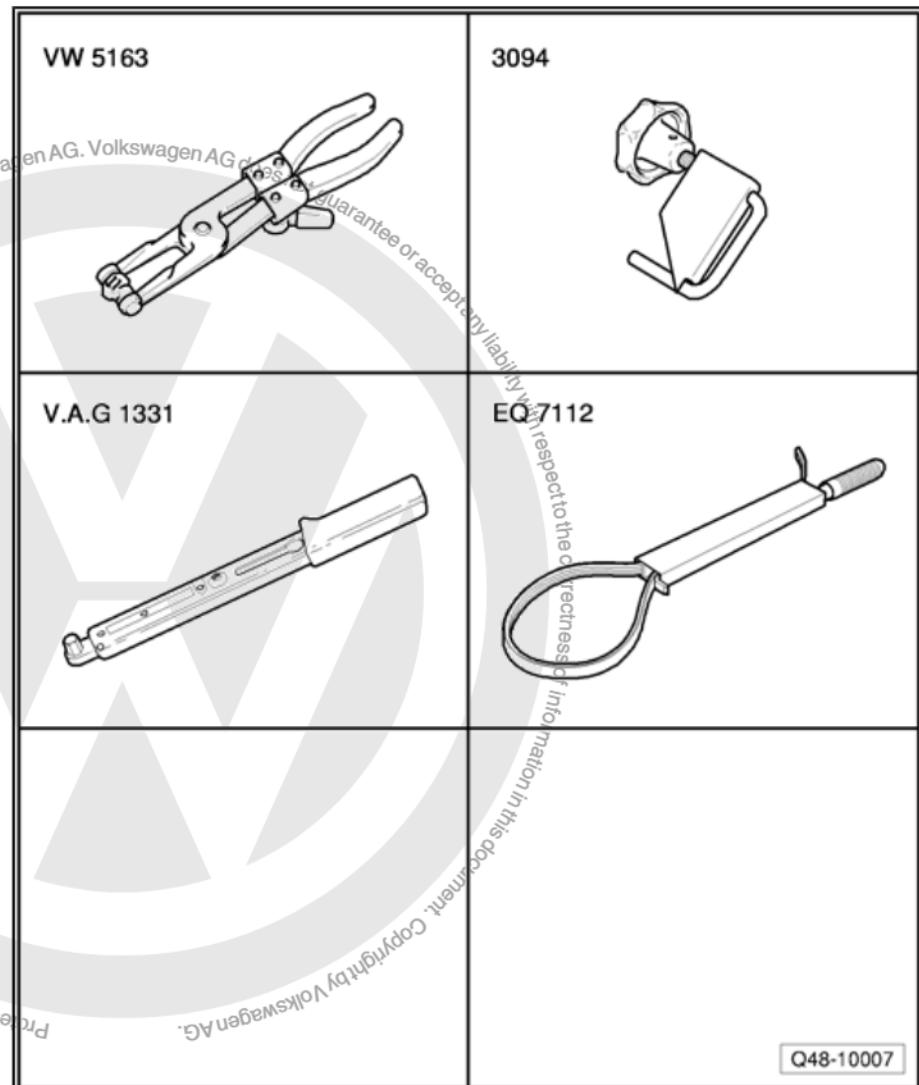


### WARNING

*Repair works in the hydraulic pump are not expected.*



Special tools and workshop equipment required

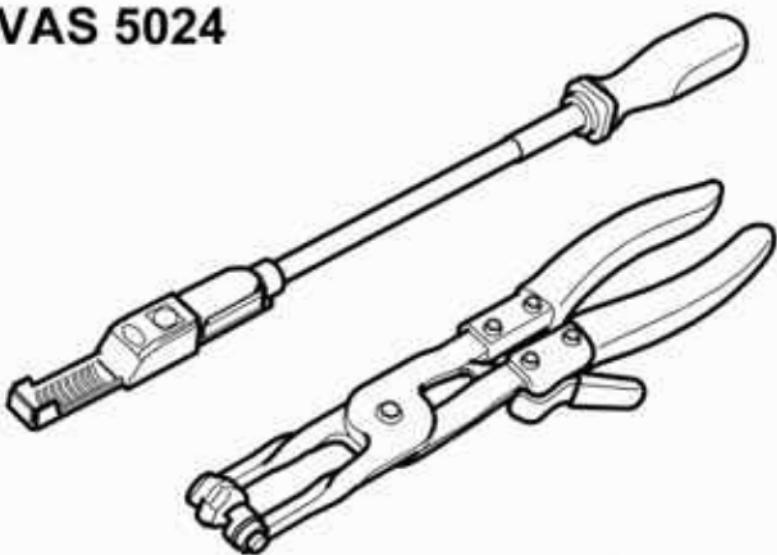


Q48-10007

- ◆ Clamp Pliers - VW 5163-
- ◆ Clamps (diameter 25 mm) - 3094-
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Poly-V pulley locking rod - EQ-7112-



## VAS 5024



Q00-10077

- ◆ Pliers or Hazet 790-1 - VW 5024-

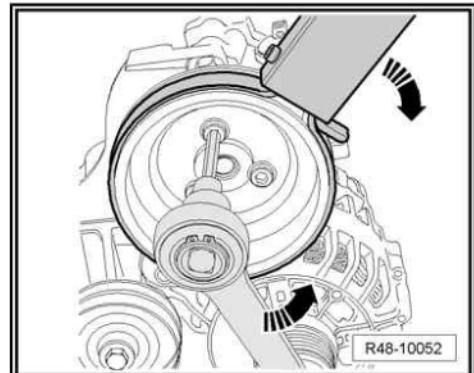


### Note

- ◆ *Replacement pumps are not filled with oil. Therefore, before proceeding with the respective installation, fill with Hydraulic oil - 325 029 901 1- and turn manually. Otherwise, there may be noises during the operation or damages to the pump*
- ◆ *Amount of oil in the system: 0,7 ... 0,9 l.*

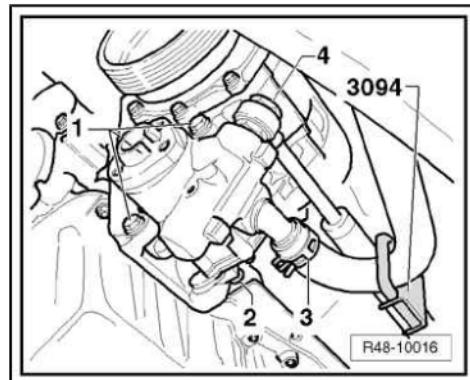
### 6.3.1 Removal

- Remove the lower engine noise insulation, if any ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .
- Remove the Poly-V belt or, depending on the vehicle's year, remove the (elastic) Poly-V belt ⇒ 4-cylinder injection engine.; Rep. gr. 13 ; Crankshaft, pistons .
- Using the Poly-V locking rod - EQ7112- to fasten the pulley, release the internal hexagonal head bolts from the Poly-V belt pulley.
- Remove the internal hex head bolt from the Poly-V belt pulley.
- Remove the pump pulley.



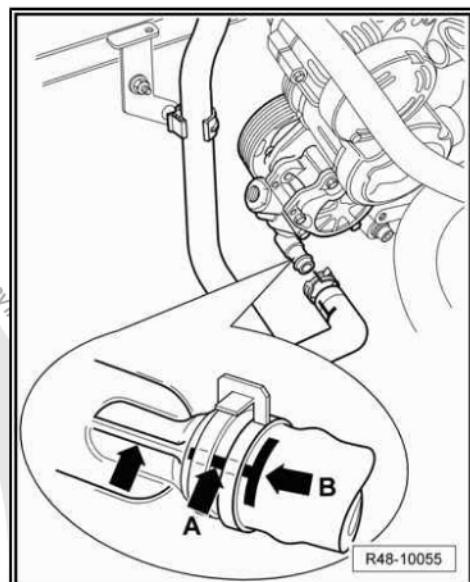


- Strangle the intake tube with the Clamps (diam. 25 mm) - 3094- .
- Using the Clamp Pliers - VW 5163- , open the clamp -3- using clamp pliers and release the intake tube.
- Loosen the hollow screw -4-.
- Close the pressure line with a plastic bag or similar object.
- Loosen the hex head screws -1- and -2-.
- Remove the pump.



### 6.3.2 Installation

- Fill the hydraulic pump with hydraulic oil. Introduce oil through the pump intake nozzle.
- Manually turn the hub until oil comes out from the pressure side.
- Install hydraulic pump on support and tighten bolts. Tightening torque, see [⇒ Item 8 \(page 265\)](#) .
- Insert the intake tube and install the clamp. The mark -arrow A- must align with the seam -arrow-. Clamp must be parallel to (facing) marking -arrow B-.
- Install the new sealants over the hollow screw.
- Install and tighten the hollow bolt. Tightening torque, see [⇒ Item 2 \(page 265\)](#) .
- The rest of the installation is processed in the reverse order from removal.

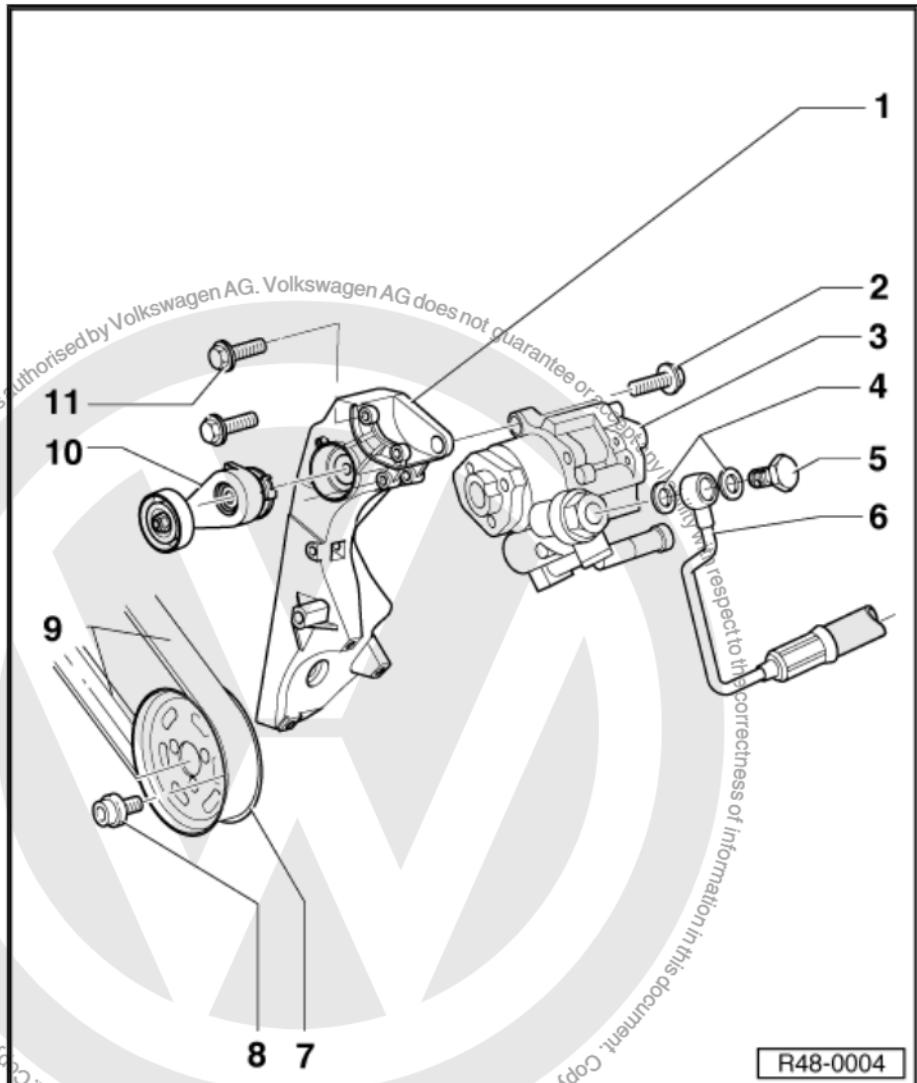


### 6.4

#### Hydraulic pump installed on the upper section - assembly overview



- 1 - Mounting bracket
- 2 - Screw
  - $23 \pm 2.3 \text{ Nm}$
  - Replace once removed
- 3 - Hydraulic pump
  - Operating pressure -  
check [page 273](#).
- 4 - Seals
  - Replace once removed
- 5 - Hollow bolt
  - $38 \pm 4 \text{ Nm}$
- 6 - Pressure tubes
- 7 - Poly-V belt pulley
- 8 - Screw
  - $23 \pm 2.3 \text{ Nm}$
  - Replace once removed
- 9 - Poly-V belt
- 10 - Tensioning element for Poly-V belt
- 11 - Screw
  - $23 \pm 2.3 \text{ Nm}$
  - Replace once removed



R48-0004

## 6.5 Vehicles with hydraulic pump installed on the lower section - remove and install

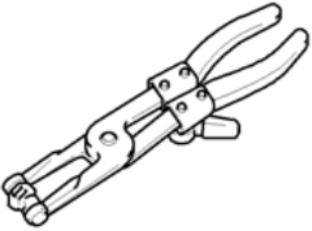


### WARNING

*Repair works in the hydraulic pump are not expected.*



Special tools and workshop  
equipment required

VW 5163	3094
	
V.A.G 1331	EQ 7112

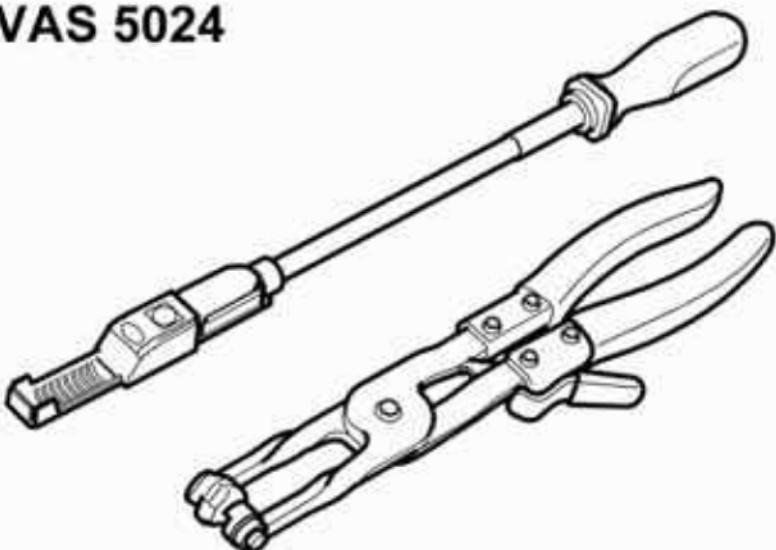
Q48-10007

- ◆ Clamp Pliers - VW 5163-
- ◆ Clamps (diameter 25 mm) - 3094-
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Poly-V pulley locking rod - EQ-7112-

or



## VAS 5024



Q00-10077

- ◆ Pliers or Hazet 790-1 - VW 5024-

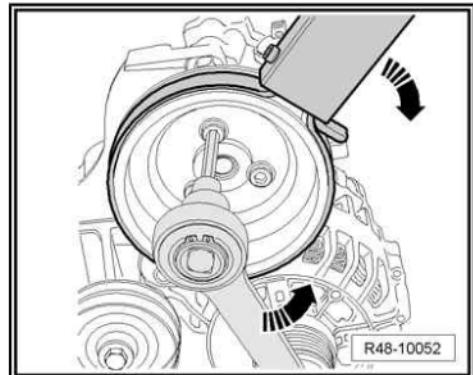


### Note

- ◆ *Replacement pumps are not filled with oil. Therefore, before proceeding with the respective installation, fill with Hydraulic oil - 325 029 901 1- and turn manually. Otherwise, there may be noises during the operation or damages to the pump*
- ◆ *Amount of oil in the system: 0,7 ... 0,9 l.*

### 6.5.1 Removal

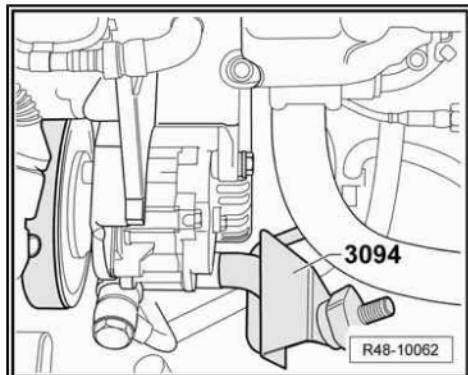
- Remove the noise insulation, if any ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .
- Remove the Poly-V belt or, depending on the vehicle's year, remove the (elastic) Poly-V belt ⇒ 4-cylinder injection engine.; Rep. gr. 13 ; Crankshaft, pistons .
- Using the Poly-V locking rod - EQ7112- to fasten the pulley, release the internal hexagonal head bolts from the Poly-V belt pulley.
- Remove the internal hex head bolt from the Poly-V belt pulley.
- Remove the pump pulley.
- Remove the pump intake hose.



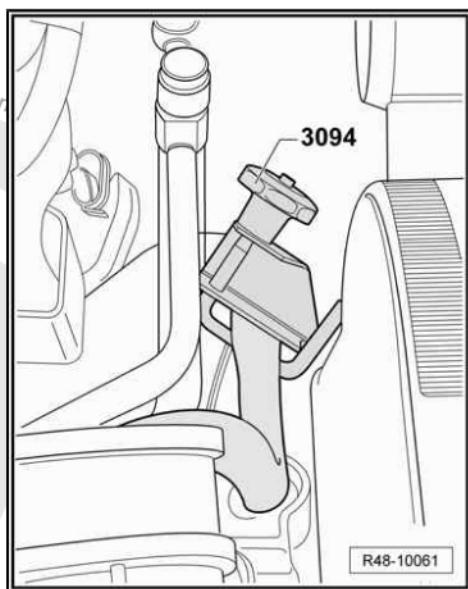


- Strangle the intake tube with the Clamps (diam. 25 mm) - 3094- .
- Open clamp and release intake tube.

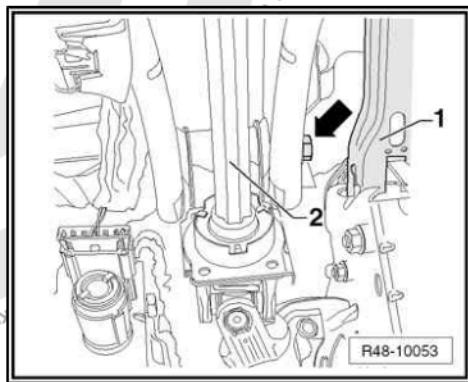
Use the Pliers or Hazet 790-1 - VW 5024- or Clamp Pliers - VW 5163- .



- Strangle the fuel return line with the Clamps (diam. 25 mm) - 3094- .
- Remove the hollow bolt.
- Close the pressure tubes with a plastic bag or similar object.



- Loosen the hex head screws -1- and -2-.
- Remove the hydraulic pump.



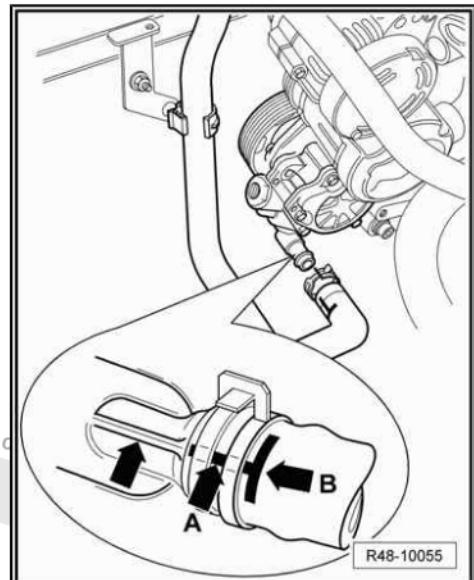
## 6.5.2 Installation

- Fill the hydraulic pump with hydraulic oil, inserting through the pump intake nozzle.
- Manually turn the hub until oil comes out from the pressure side.
- Install hydraulic pump on support and tighten bolts. Tightening torque, see [Item 11 \(page 269\)](#) .



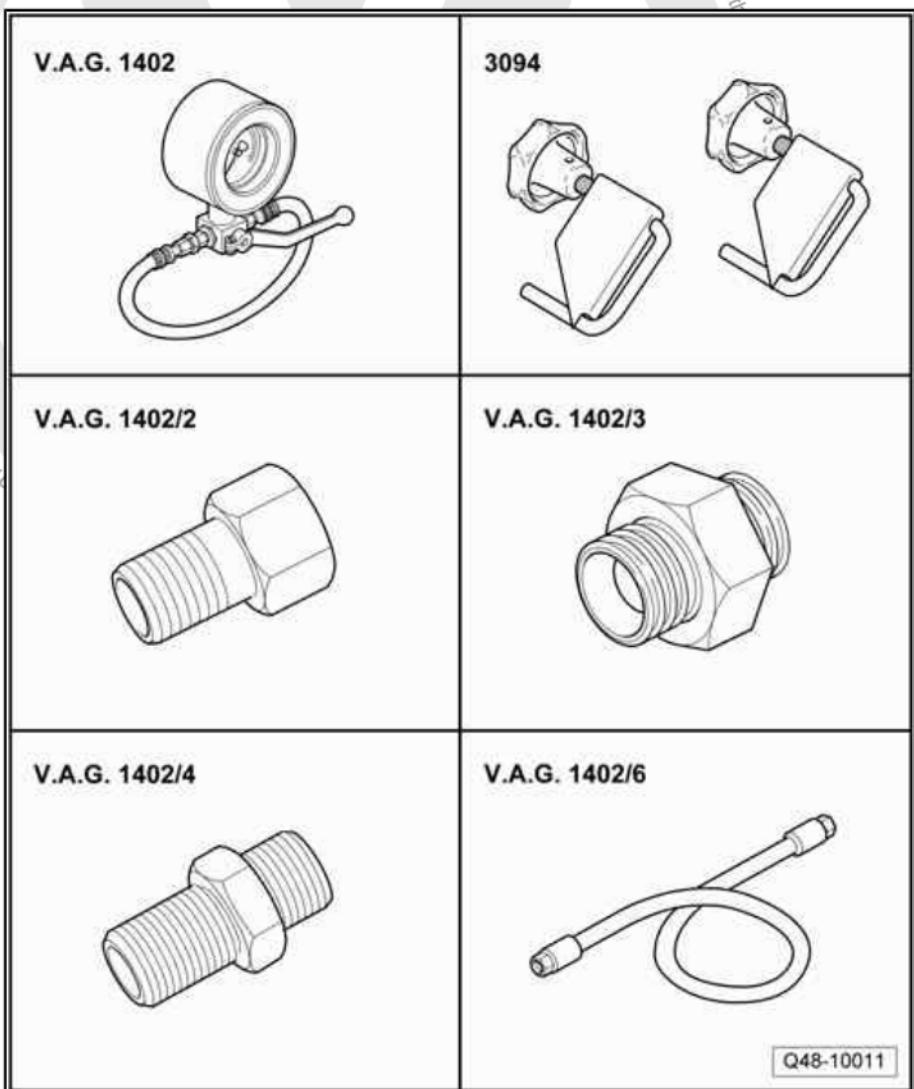
- Insert the intake tube and install the clamp. The mark -arrow A- must align with the seam -arrow-. The clamp must be perpendicular to the mark -arrow B-.
- Install the new sealants over the hollow screw.
- Install and tighten the through-bolts. Tightening torque, see [⇒ Item 5 \(page 269\)](#).

The rest of the installation is processed in the reverse order from removal.



## 6.6 Hydraulic pump operating pressure - check

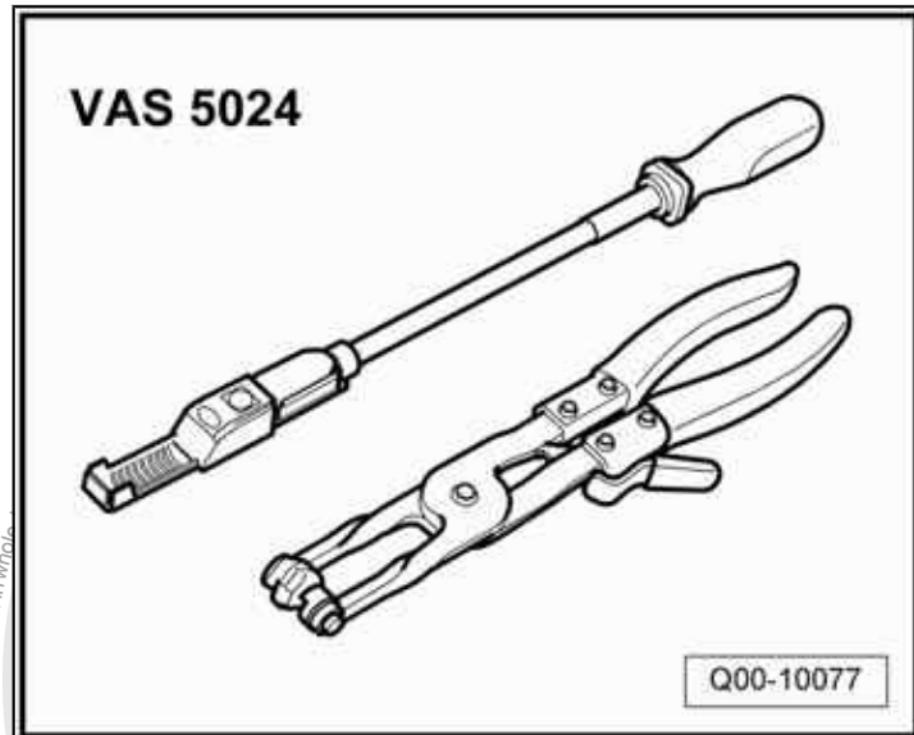
Special tools and workshop equipment required



◆ Control equipment for power steering - VAG 1402-



- ◆ Clamps (diameter 25 mm) - 3094-
- ◆ Adapter - V.A.G 1402/2-
- ◆ Adapter - V.A.G 1402/3-
- ◆ Adapter - V.A.G 1402/4-
- ◆ Adapter - VAG 1402/6-

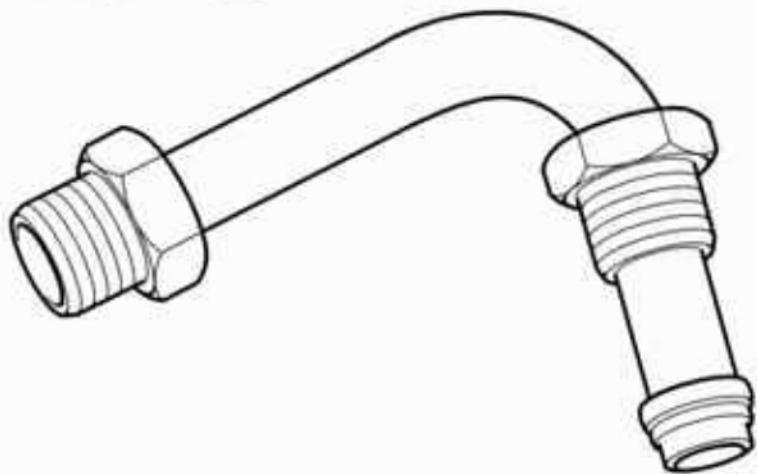


- ◆ Pliers or Hazet 790-1 - VW 5024-

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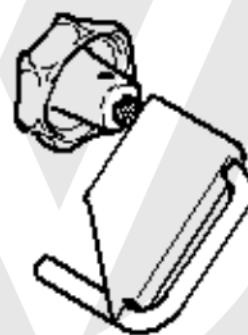
## V.A.G 1402/1



Q00-10076

- ◆ Adapter - V.A.G 1402/1-

3093

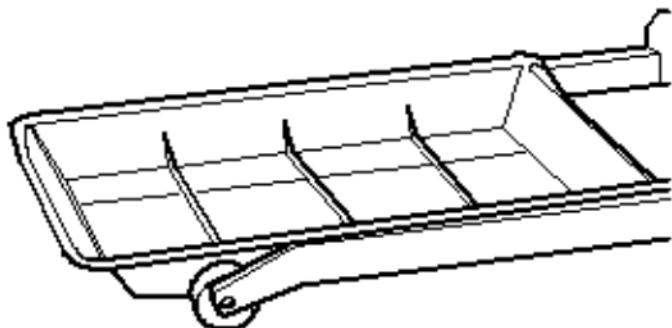


W00-0671

- ◆ Clamps (diameter 40 mm) - 3093-



V.A.G 1306

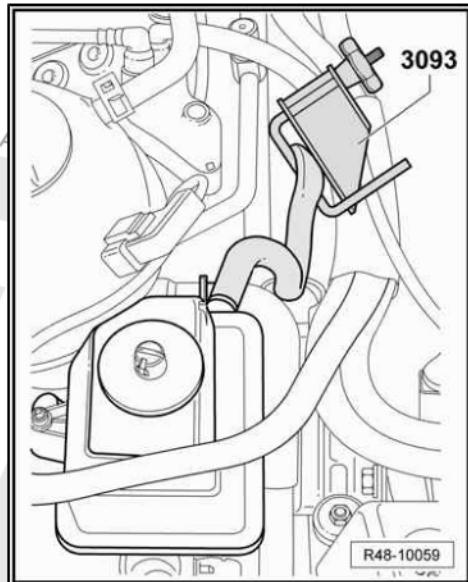


W00-0512

♦ Oil collecting tray - V.A.G 1306-

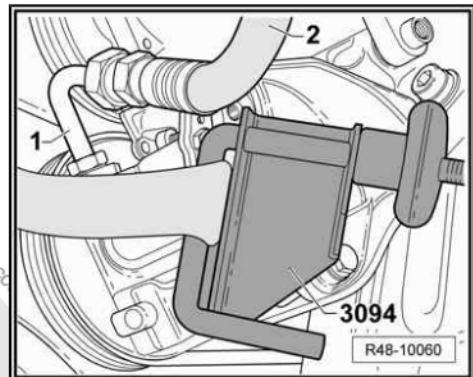
#### 6.6.1 Vehicles with hydraulic pump installed on the lower section

- Strangle the fuel return line with the Clamps (diam. 40 mm) - 3093- .
- Remove the noise insulation, if any => General body repairs, exterior; Rep. gr. 50 ; Body - front section .





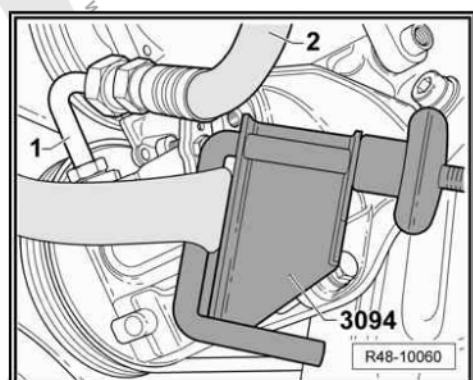
- Strangle the evacuation line with the Clamps (diam. 25 mm) - 3094- .
- Install the oil collection reservoir below the vehicle.
- Loosen the pump pressure tube.



- Insert the adapter -1-. Use seal [Item 5 \(page 279\)](#) .

1 - Adapter - V.A.G 1402/2-

2 - Flexible tub from the adapter set -V.A.G 1402/6-



- Install the pressure gauge with the Adapter - V.A.G 1402/2- .

1 - - Adapter V.A.G 1402/1-

2 - - Adapter - V.A.G 1402/6-

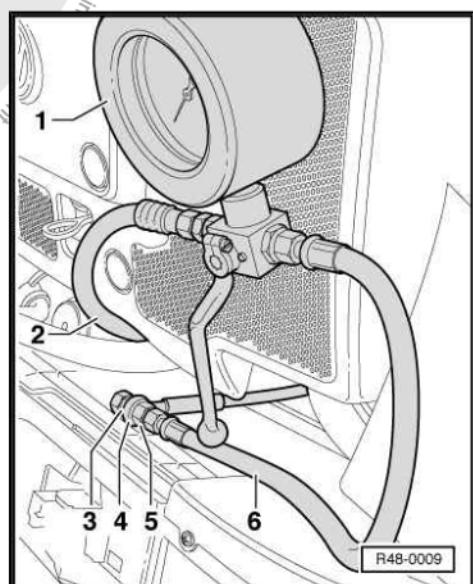
3 - - Hollow screw

4 - - Flexible pressure tube supporting ring

5 - - V.A.G 1402/2-

6 - - Flexible tube from the Adapter - V.A.G 1402/2- .

- Remove the Clamps (diam. 25 mm) - 3094- from the evacuation line and the return line.
- Start the engine and, if necessary, replenish the compensation reservoir fluid level.
- Turn the steering wheel approx. 10 times, from stop to stop.
- Check the operating pressure.



## 6.6.2 Checking conditions:

- Poly-V belt/Poly-V belt voltage OK
- System tightness ok
- Flexible tubes/pipes not bent and/or pressed.
- Close the cut-off valve (not longer than 5 seconds) during the engine idling and read pressure.

Nominal value:

- ◆ Hydraulic pump - 5Z0 422 154- with nominal value of  $100 \pm 5$  bar
- ◆ Hydraulic pump - 1J0 422 154 A- with nominal value of  $100 \pm 4$  bar



- ◆ Hydraulic pump - 2K0 422 154- with nominal value of  $104 \pm 4$  bar
- ◆ Hydraulic pump - 2K0 422 154 A- with nominal value of  $104 \pm 4$  bar
- ◆ Hydraulic pump - 1J0 422 152 F- with nominal value of  $100 \pm 4$  bar
- ◆ Hydraulic pump - 1J0 422 152 M- with nominal value of  $100 \pm 4$  bar

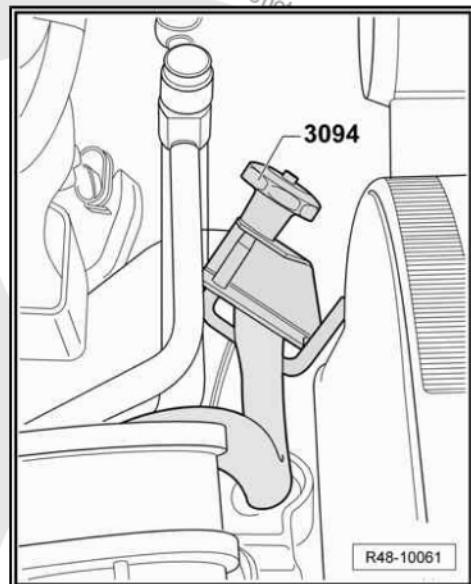


Note

- ◆ Replace the pump if the nominal value is not reached or is exceeded
- ◆ Remove and install the hydraulic pump. Vehicles with hydraulic pump installed on the lower section [⇒ page 265](#).
- ◆ Remove and install the hydraulic pump. Vehicles with hydraulic pump installed on the upper section [⇒ page 268](#).
- ◆ Check the steering system for tightness if there is lack of oil in the reservoir.
- ◆ Check the tubes/piping connections for tightness; if necessary, close and dry.
- ◆ Replace the steering box if the pinion or gear rack seal on the steering rack is leaking.
- ◆ To check the gear rack seal, open the protective boot piping clamp and push the protective boot aside.

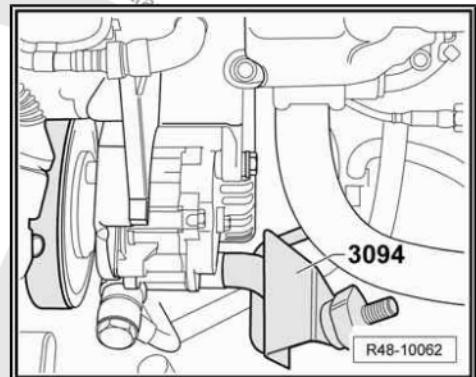
### 6.6.3 Vehicles with hydraulic pump installed on the upper section

- Remove the engine cover.
- Strangle the fuel return line with the Clamps (diam. 25 mm) - 3094- .





- Strangle the evacuation line with the Clamps (diam. 25 mm) - 3094- .
- Install the oil collection reservoir below the vehicle.
- Loosen the pump pressure tube.



#### 6.6.4 Control equipment for power steering - VAG 1402- - connect

1 - Power steering control equipment - VAG 1402-

2 - Hose to Power steering control system - VAG 1402-

3 - Adapter - VAG 1402/6-

4 - Adapter - V.A.G 1402/4-

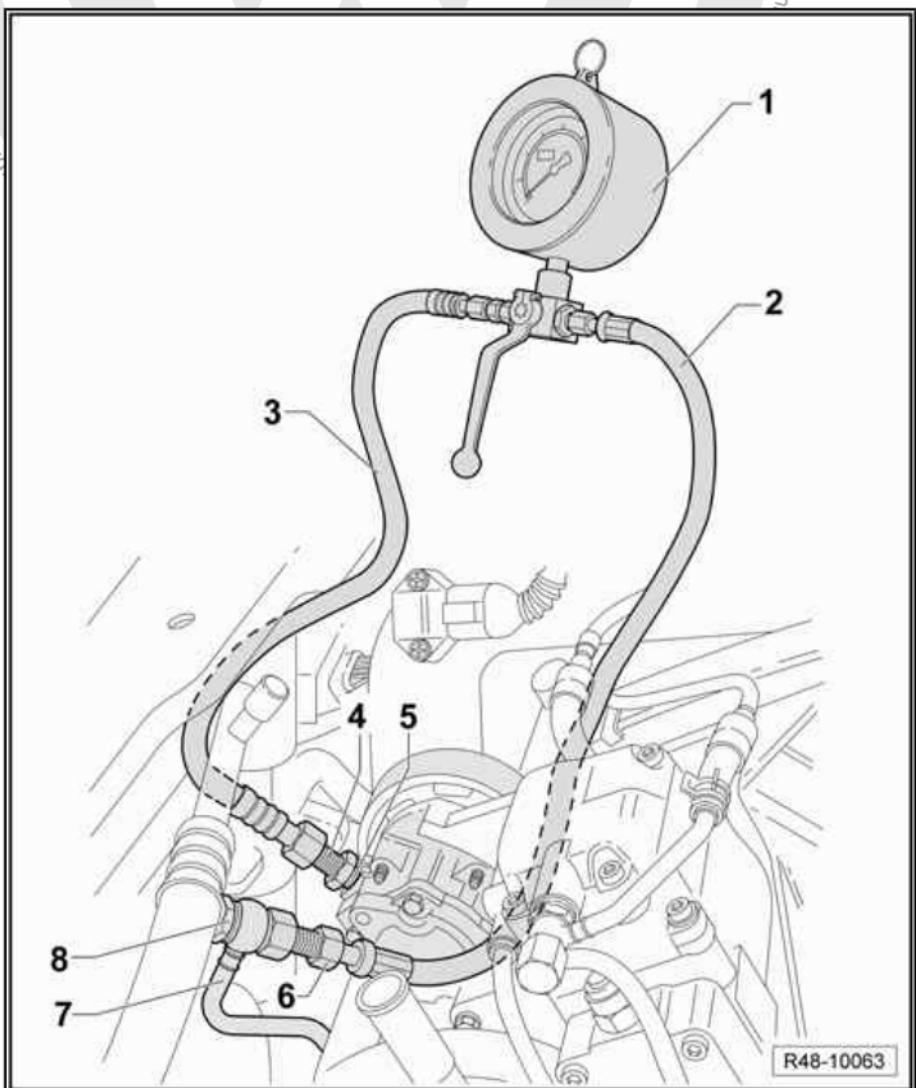
5 - Seals

□ 2 units

6 - Adapter - V.A.G 1402/2-

7 - Pressure tubes with ring support

8 - Hollow bolt



- Remove the Clamps (diam. 25 mm) - 3094- from the evacuation line and the return line.
- Start the engine and, if necessary, replenish the compensation reservoir fluid level.
- Turn the steering wheel approx. 10 times, from stop to stop.
- Check the operating pressure.



### 6.6.5 Checking conditions:

- Poly-V belt/Poly-V belt tightness OK
- System tightness OK.
- Flexible tubes/pipes not bent and/or pressed.
- Close the cut-off valve (not longer than 5 seconds) during the engine idling and read pressure.

Nominal value:

- ◆ Hydraulic pump - 5Z0 422 154 with nominal value of  $100 \pm 5$  bar
- ◆ Hydraulic pump - 1J0 422 154-A- with nominal value of  $100 \pm 4$  bar
- ◆ Hydraulic pump - 2K0 422 154 with nominal value of  $104 \pm 4$  bar
- ◆ Hydraulic pump - 2K0 422 154 A- with nominal value of  $104 \pm 4$  bar

#### Note

- ◆ Replace the pump if the nominal value is not reached or is exceeded:
- ◆ Remove and install the hydraulic pump, Vehicles with hydraulic pump on the upper section [⇒ page 269](#).
- ◆ Remove and install the hydraulic pump, Vehicles with hydraulic pump on the lower section [⇒ page 265](#)
- ◆ Check the steering system for tightness if there is lack of fluid in the reservoir.
- ◆ Check the tubes/piping connections for tightness; if necessary, close and dry.
- ◆ Replace the steering box if the pinion or gear rack seal on the steering box is leaking.
- ◆ To check the gear rack seal, open the protective boot piping clamp and push the protective boot aside.

### 6.7 Power steering system fluid - replenish

#### Note

Use Hydraulic oil - 325 029 901 1- for power steering. Refer to ⇒ Electronic Parts Catalogue "ETKA"

- Lift the vehicle until the wheels turn freely.
- Turn the steering wheel from stop to stop 10 times, with the engine stopped.
- Check the hydraulic oil level and replenish, if necessary.
- Loosen the hydraulic oil reservoir lid.
- Start the engine and run for 10 seconds.
- Switch the engine off.
- Check the hydraulic oil level and replenish, if necessary.
- Loosen the hydraulic oil reservoir lid.



Repeat the work sequence below until the hydraulic oil level no longer lowers:

- Run the engine.
- Turn the steering wheel 10 times from stop to stop.
- Switch the engine off.
- Check the hydraulic oil level and replenish, if necessary.
- After concluding the procedure, tighten the reservoir lid.





## 7 Electro hydraulic steering (Europe exclusive) - repair



### WARNING

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Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)

*Replace self-locking nuts and bolts subject to angular torque.*



### Note

*The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"*

### 7.1 Electro hydraulic steering (Manufacturer Koyo) - assembly overview



### WARNING

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Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)



### Note

- ◆ *The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"*
- ◆ *It is not permitted to repair the steering box. In case of complaints, replace the entire steering box.*
- ◆ *To lubricate the steering rack use only Grease for steering box - G 052 168 A1-*
- ◆ *Always replace self-locking nuts and bolts subject to angular torque*
- ◆ *Type of oil: Hydraulic oil - G 004 000 M2- , see ⇒ Electronic Parts Catalogue "ETKA"*
- ◆ *Oil filling capacity in the system: (approx. 0.8 litres)*



1 - Screw  
 8 Nm

2 - Heat shield  
 Only for some markets  
 See: ⇒ Electronic parts catalogue "ETKA"

3 - Gasket  
 Replace once removed

4 - Electro hydraulic steering sensor - G250-  
 Remove and install  
[⇒ page 292](#)  
 Check operation with the Vehicle diagnostic, testing and information system - VAS 5051- or Vehicle diagnostic, testing and information system - VAS 5052- or later equipment ⇒ Vehicle diagnostic tester.

5 - Screw  
 6 Nm

6 - Hexagonal nut  
 20 Nm + 90°  
 Replace once removed

7 - Steering arm

8 - Pressure hose

9 - Hollow bolt  
 38 ± 4 Nm

10 - Gasket  
 Replace once removed

11 - Connecting screw  
 30 Nm

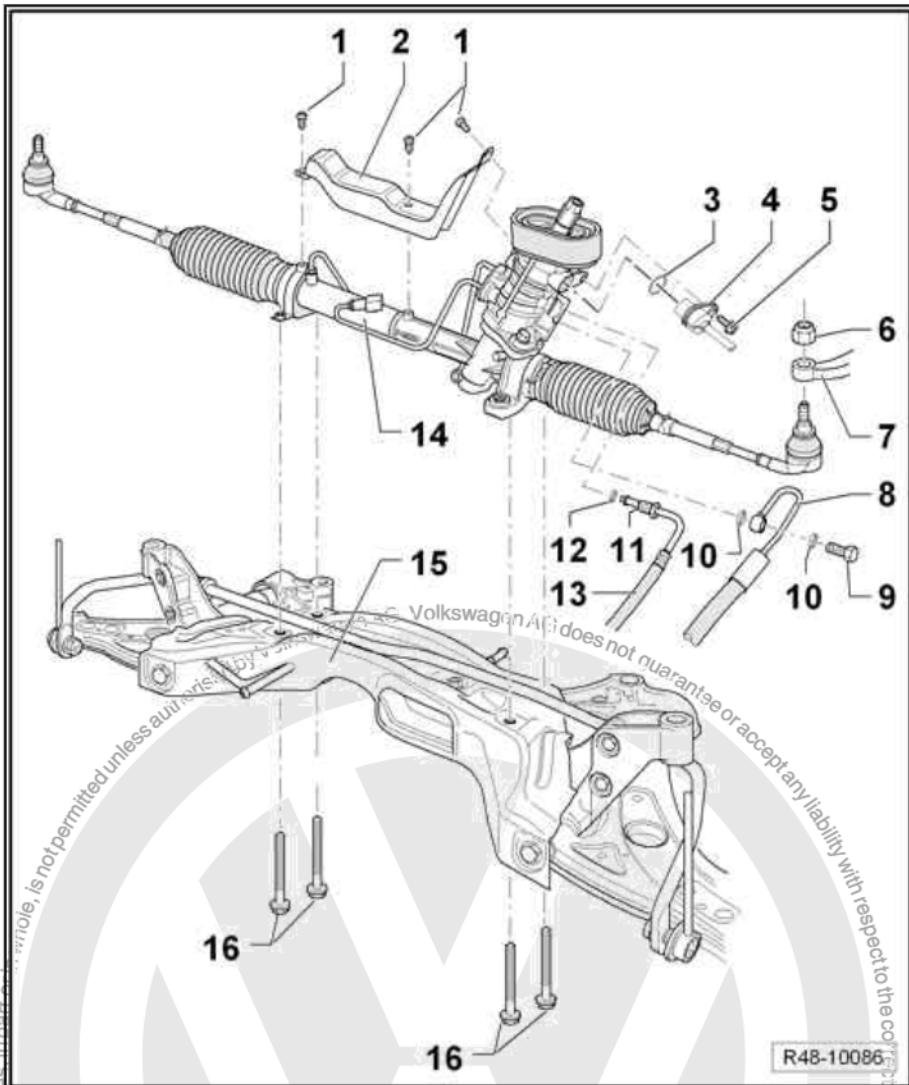
12 - Seal  
 Replace once removed

13 - Return hose

14 - Steering box  
 Remove and install [⇒ page 286](#)

15 - Auxiliary frame (assembly mounting)  
 different versions  
 See: ⇒ Electronic parts catalogue "ETKA"  
 Remove and install [⇒ page 35](#)

16 - Hexagonal bolt  
 50 Nm + 90°  
 Replace once removed





## 7.2 Electro hydraulic steering (TRW) - assembly overview



### WARNING

*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. ⇒ page 204*

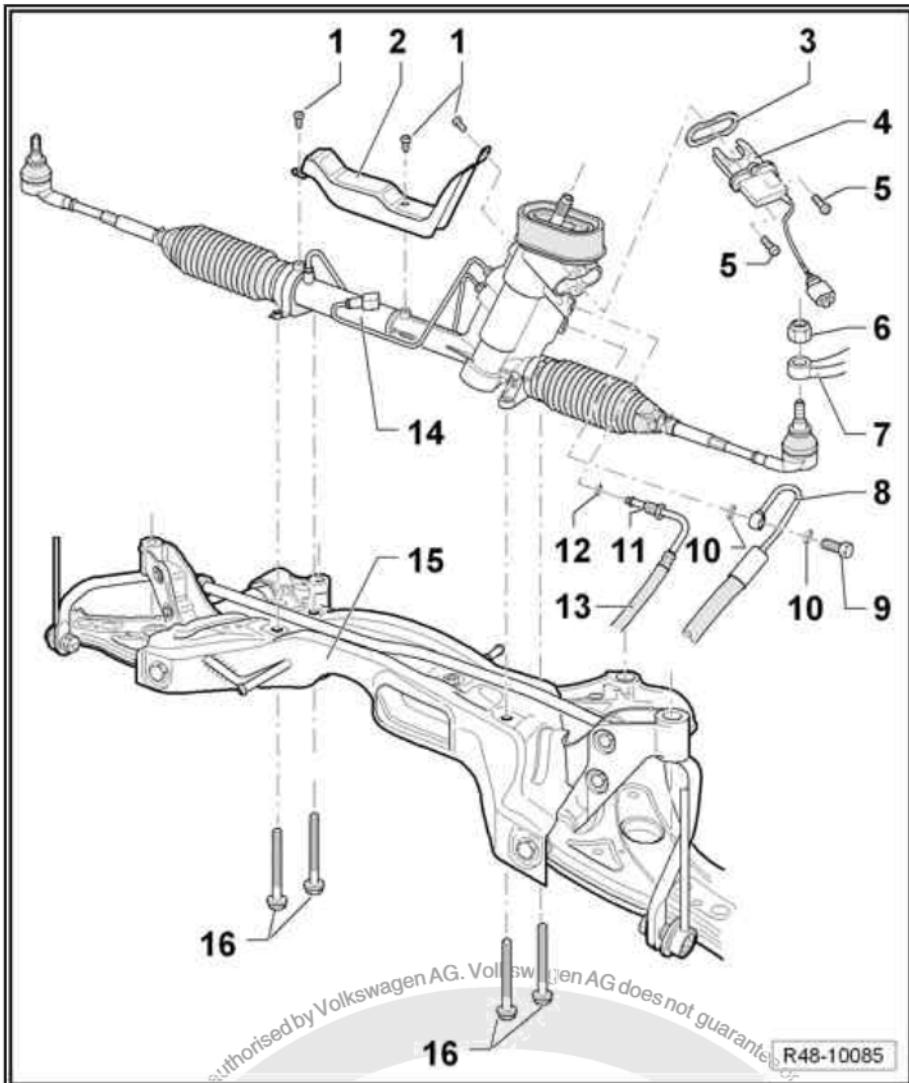


### Note

- ◆ Repairs in the steering box are not expected. In case of complaints, the steering box must be replaced
- ◆ To lubricate the steering rack use only Grease for steering box - G 052 168 A1. Refer to the ⇒ Chemicals Manual
- ◆ Always replace self-locking nuts and bolts subject to angular torque
- ◆ Type of oil: Hydraulic oil - G 004 000 M2- . Refer to the ⇒ Chemicals Manual
- ◆ Oil filling capacity in the system: approx. 0.8 litres



- 1 - Screw
  - 8 Nm
- 2 - Heat shield
  - Only for some markets
  - See: ⇒ Electronic parts catalogue "ETKA"
- 3 - Gasket
  - Replace once removed
- 4 - Electro hydraulic steering sensor - G250-
  - Remove and install ⇒ [page 292](#)
  - Check operation with the Vehicle diagnostic, testing and information system - VAS 5051- or Vehicle diagnostic, testing and information system - VAS 5052- or later equipment ⇒ Vehicle diagnostic tester.
- 5 - Screw
  - 6 Nm
- 6 - Hexagonal nut
  - 20 Nm + 90°
  - Replace once removed
- 7 - Steering arm
- 8 - Pressure hose
- 9 - Hollow bolt
  - 38 ± 4 Nm
- 10 - Gasket
  - Replace once removed
- 11 - Connecting screw
  - 30 Nm
- 12 - Seal
  - Replace once removed
- 13 - Return hose
- 14 - Steering box
  - Remove and install ⇒ [page 286](#)
- 15 - Auxiliary frame (assembly mounting)
  - different versions
  - See: ⇒ Electronic parts catalogue "ETKA"
  - Remove and install ⇒ [page 35](#)
- 16 - Hexagonal bolt
  - 50 Nm + 90°
  - Replace once removed





## 7.3 Electro hydraulic steering box - remove and install



### WARNING

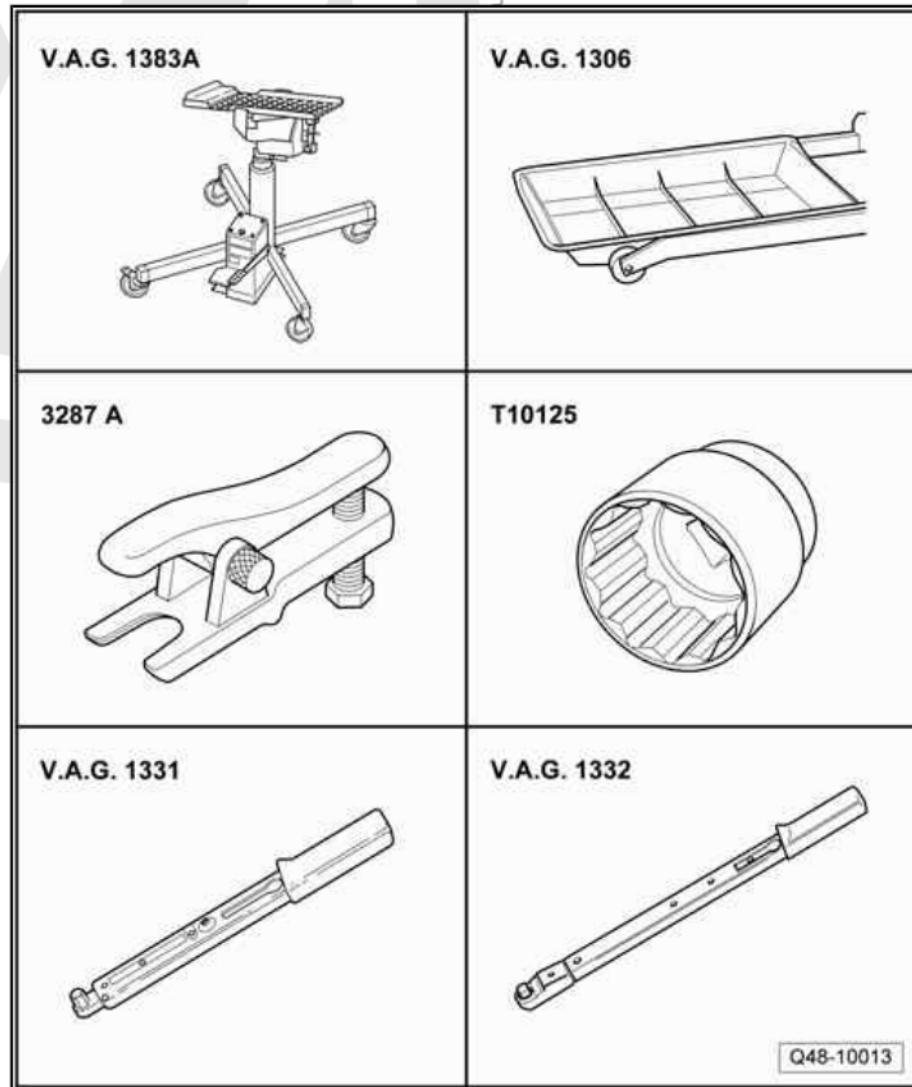
*Before performing any repairs to the vehicle's steering system, read the chapter "Miscellaneous" and check for a later need to align the vehicle. ⇒ page 204*



### Note

*The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"*

Special tools and workshop equipment required



- ◆ Gearbox or engine/gearbox set jack or EQ 7081 - VAG 1383A- and Tray for hydraulic jack EQ 7081 - VAG 1359/2-
- ◆ Oil collecting tray - VAG 1306-
- ◆ Puller - 3287 A-



- ◆ 36 mm Grooved Socket - T10125- or 36 mm grooved socket (Gedore ref. D32-36)
- ◆ 30 mm Grooved Socket (Gedore ref. D32-30)
- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-

### 7.3.1 Instructions when working on the electro hydraulic power steering box



#### WARNING

*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)*

- ◆ Absolute cleanliness is necessary when working with electro hydraulic steering
- ◆ Thoroughly clean the nearer connections and areas before disconnecting any component
- ◆ Removed parts must be placed onto a clean surface and covered if re-installing is not immediate
- ◆ Do not use cloths with lint
- ◆ Only unpack the replacement parts immediately before installing them
- ◆ Use genuine parts only

### 7.3.2 Removal



#### WARNING

*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)*

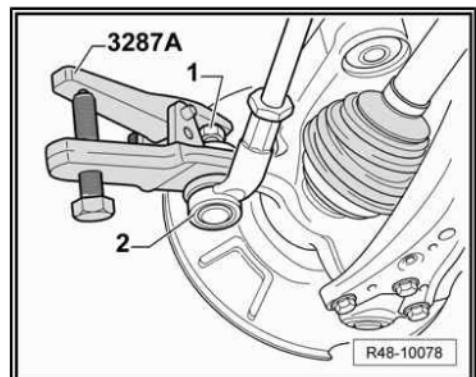
- Disconnect the Battery - A- ⇒ Electrical devices; Rep. gr. 27 ; Starter, alternator, battery .
- Remove the Battery - A- and its console ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- Raise the vehicle ⇒ Maintenance ; Booklet 22.1 ; Service descriptions, lifting the vehicle up to working height.
- Remove the front wheels.
- Loosen the hexagonal nut -1- from the steering terminal.



#### WARNING

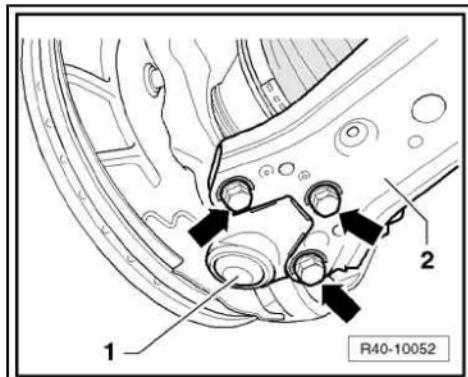
*To protect the thread, leave the nut screwed a few turns at the steering terminal.*

- Separate the steering terminal -2- from the wheel roller bearing case using the Puller - 3287 A- .

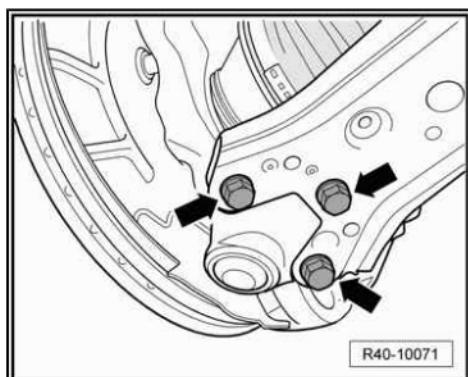




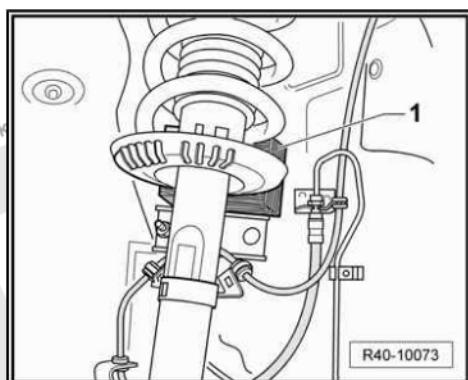
- Mark the installation position for the screws -arrows- from the swivel guide -1- on the wishbone -2-.



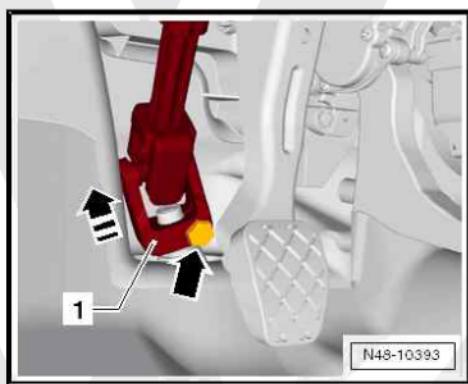
- Remove the mounting bolts -arrows-.
- Remove the suspension strut with the swivel joint, moving it away from the wishbone.



- Pull the suspension strut out and support it using a wood block -1- (for example).



- Remove the securing bolt -arrow- from the universal joint -1- and uncouple the universal joint -towards the arrow-.

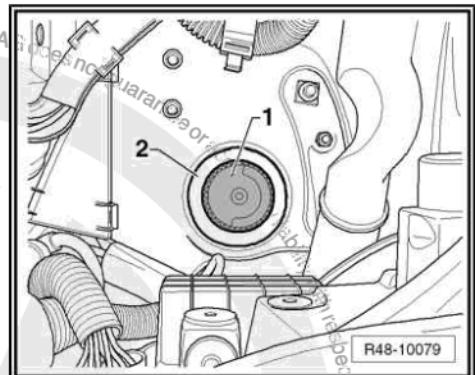




- Remove the cover -1- from the motor/pump set -2-.
- Remove as much hydraulic oil from the pump as possible, with the help of a suction bottle.

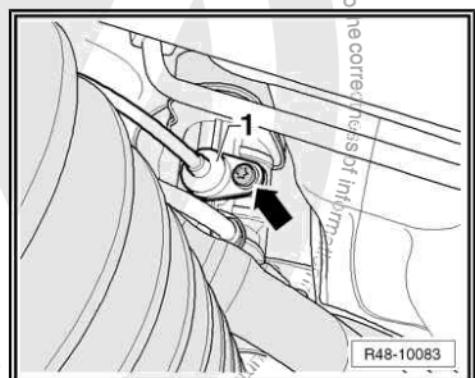
Vehicles with electro hydraulic steering (Manufacturer Koyo):

- Remove the screw -arrow-.



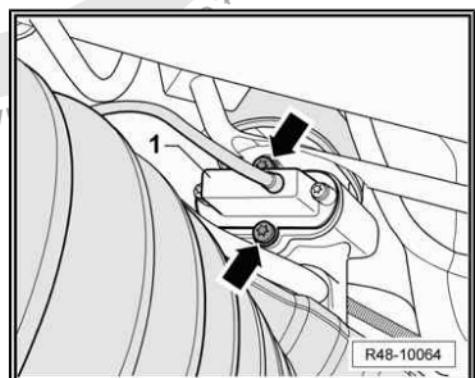
- Remove the Electro hydraulic steering sensor - G250- -1- from the steering box.

Vehicles with electro hydraulic steering (TRW):

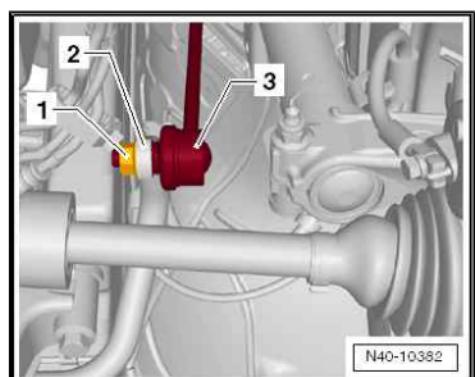


- Remove the bolts -arrows-.
- Remove the Electro hydraulic steering sensor - G250- -1- from the steering box.

Continuation for all vehicles:

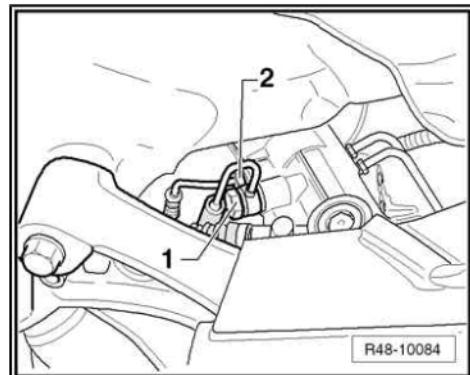


- Remove the hexagonal nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from the anti-roll bar -2-.





- Remove the connection bolt -1- for the steering box pressure duct.
- Remove the connection bolt -2- for the steering box return duct.
- Seal the ducts with the help of a plastic bag and adhesive tape.
- Seal the threaded holes of the electro hydraulic steering box with threaded plastic plugs.
- Remove the auxiliary frame (sub-frame) [⇒ page 35](#).
- Remove the electro hydraulic steering box.



#### Note

*The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. [⇒ Electronic Spare Parts Catalogue "ETKA"](#)*

### 7.3.3 Installation



#### WARNING

*Before performing any repairs to the vehicle's steering system, read the chapter "miscellaneous" and check for a later need to align the vehicle. [⇒ page 204](#)*

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

*Always replace self-locking nuts and bolts subject to angular torque*

- ◆ Use new sealants for the hoses/ducts
- ◆ Lubricate the steering box joint with lubricant such as soap, for example, before installing the steering box
- ◆ After fitting the steering box in the universal joint of the column, make sure that the joint is against the assembly plate, without twisting, and that it seals the opening for the pedal area correctly. There may be noises and even water infiltration
- ◆ Make sure that the sealing surfaces are clean
- ◆ When replacing the electro hydraulic steering box, also replace the track rod boots

Before installing the auxiliary frame (sub-frame) screws, position the electro hydraulic steering box on the auxiliary frame and install the screws for the electro hydraulic steering box.

- Remove the auxiliary frame (sub-frame) [⇒ page 35](#).
- Install the steering box to the auxiliary frame. Tightening torque, see [⇒ page 291](#).
- Install the track rod to the steering arm. Tightening torque, see [⇒ page 291](#).

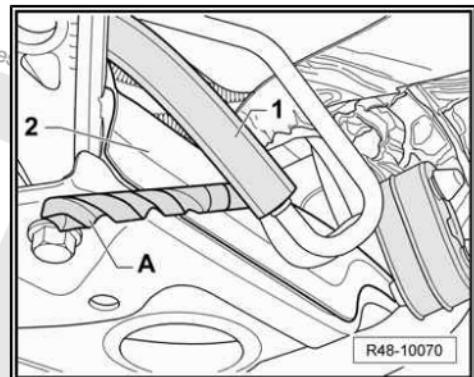


- Install the Electro hydraulic steering box - G250-  
[⇒ page 292](#).
- Install the return hose and tighten the connecting bolt.
- If the pressure duct extends beyond the auxiliary frame, the distance between the pressure duct and the auxiliary frame must be adjusted.
- The distance between the pressure duct -1- and the auxiliary frame -2- must be of 10 mm.
- To perform this operation, use a 10 mm drill bit -A- between the pressure duct -1- and the auxiliary frame -2-.
- Then, tighten the pressure duct hollow screw  
[⇒ Item 9 \(page 283\)](#).



Note

*Make sure that the pressure duct does not interfere with the body and the auxiliary frame*



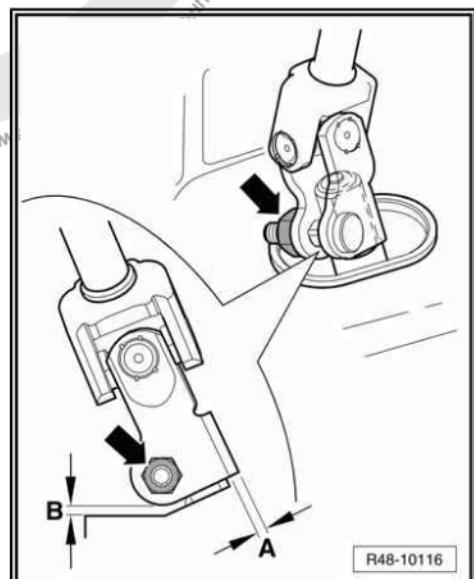
- Install the wheel and tighten the securing bolts [⇒ page 203](#).
- Fill with new hydraulic oil, using a hose with 400 to 500 mm of length and a funnel.
- Use Hydraulic oil -G 004 000 M2-. Refer to the [⇒ Chemicals Manual](#).
- Install the universal joint on the steering box pinion.



Note

*Measurement -A- should be parallel to the steering box pinion axle and measurement -B- should be the minimal in order not to interfere with the lining.*

- Tighten the union nut -arrow-. Tightening torque, see [⇒ page 291](#).
- Install the Battery - A- [⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery](#).
- Connect the Battery - A- [⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery](#).
- Bleed the steering system [⇒ page 310](#).
- Complete the hydraulic oil level [⇒ page 312](#).
- Check alignment [⇒ page 204](#).



Tightening torques

Components	Tightening torques
Steering terminal to the wheel roller bearing case ♦ Use new fastening nuts	20 Nm + 90°
Coupling rod to anti-roll bar ♦ Use new fastening nuts	40 Nm
Swivel joint to wishbone ♦ Use new fastening screws	20 Nm + 90°



Components	Tightening torques
Steering box steering column ◆ Use new securing nut (vehicles 5Z1) ⇒ <a href="#">Item 4 (page 222)</a>	15 Nm + 50°
Steering box to auxiliary frame ◆ Use new fastening screws	50 Nm + 90°

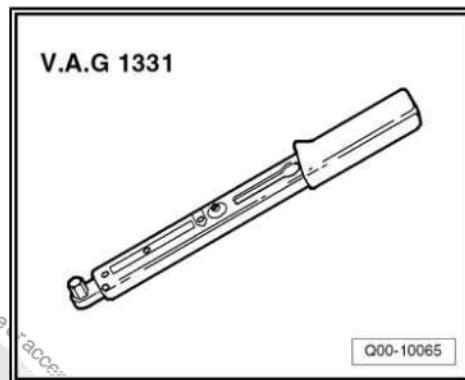
## 7.4 Electro hydraulic steering box - G250- - remove and install



*The Koyo-brand electro-hydraulic steering is longer supplied.  
 That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"*

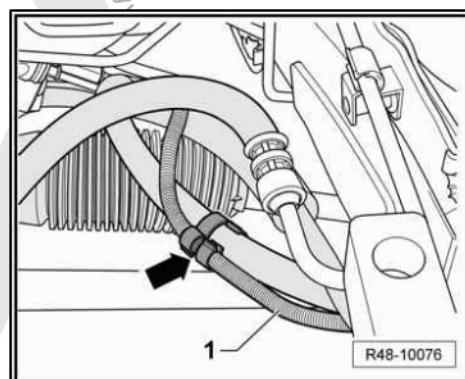
Special tools and workshop equipment required

- ◆ "Torque wrench – 5 to 50 Nm 1/2" drive) - VAG 1331-



### 7.4.1 Removal

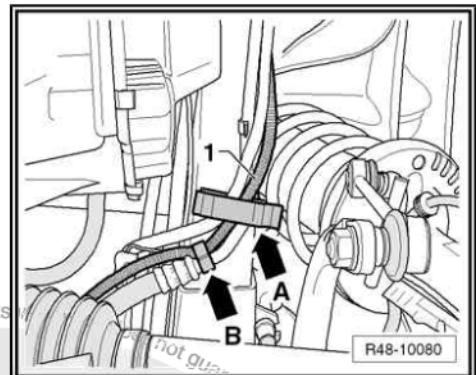
- Remove the cable -1- of the Electro hydraulic steering sensor - G250- from the supports -arrow-.
- Remove the left front wheel.
- Remove the left front wheel arch cover ⇒ Body - External assembly works; Rep. gr. 66 ; External equipment .



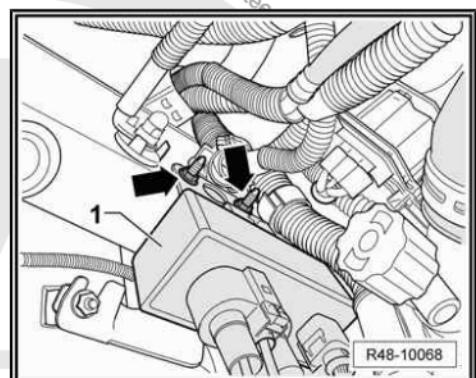


- Open the spacer -arrow A-.
- Remove the cable -1- of the Electro hydraulic steering sensor - G250- from the supports -arrow B-.

Vehicles with air conditioning:

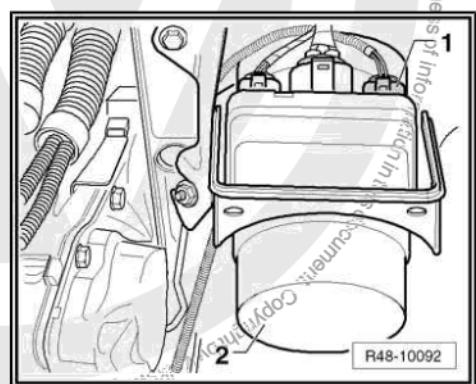


- Remove the radiator fan control unit -1- from the car body -arrows-.



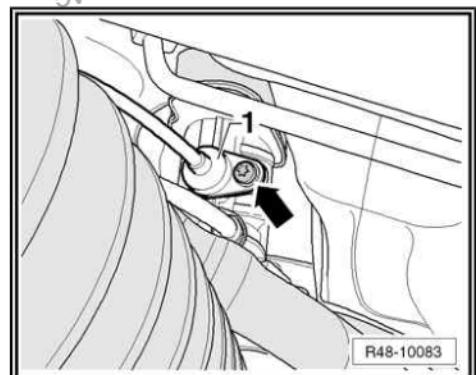
- Disconnect the connector -1- from the motor/pump set -2-.

Vehicles with electro hydraulic steering (Manufacturer Koyo):



- Remove the screw -arrow-.
- Remove the Electro hydraulic steering sensor - G250- -1- from the steering box.

Vehicles with electro hydraulic steering (Manufacturer TRW):

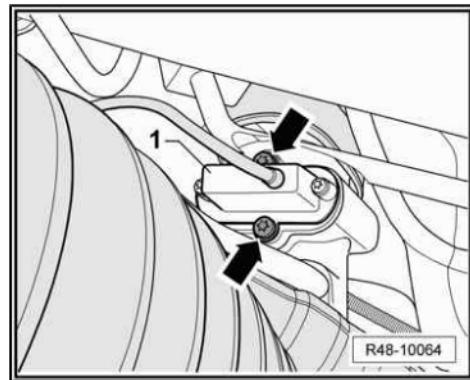




- Remove the bolts -arrows-.
- Remove the Electro hydraulic steering sensor - G250- -1- from the steering box.



*The Koyo-brand electro-hydraulic steering is longer supplied.  
That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"*



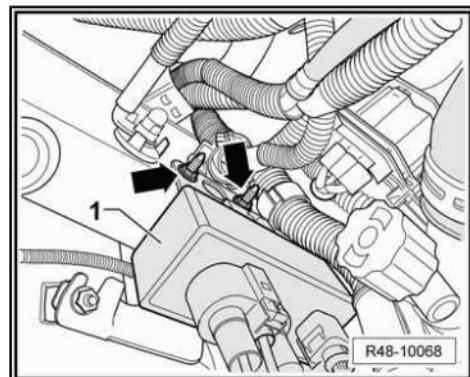
#### 7.4.2 Installation

- Install the Electro hydraulic steering sensor - G250- on the steering box. Tightening torque, see [Item 5 \(page 283\)](#) .
- Connect the connector to the motor/pump set.

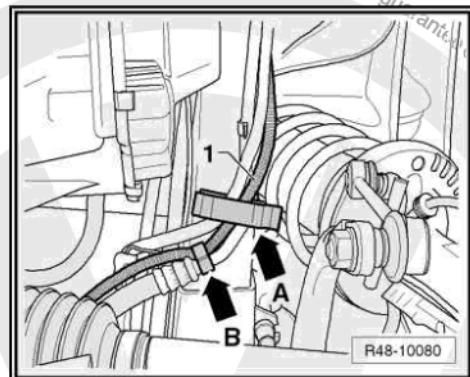
Vehicles with air conditioning:

- Install the radiator fan control unit -1- on the longitudinal member fastening the nuts -arrows- to 6 Nm.

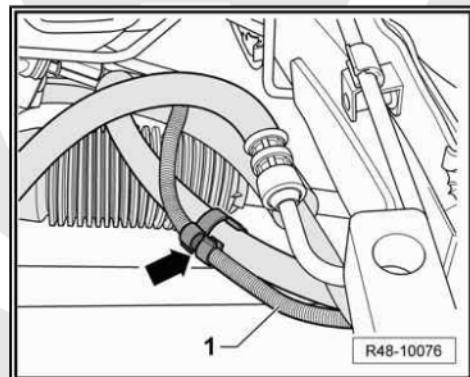
Continuation for all vehicles:



- Install the cable -1- of the Electro hydraulic steering sensor - G250- on the support -arrow B-.
- Close the spacer -arrow A-.



- Install the cable -1- of the Electro hydraulic steering sensor - G250- on the support -arrow B-.
- Install the left front wheel arch cover ⇒ General body repairs, exterior; Rep. gr. 66 ; External equipment .
- Install the wheel and tighten the screws [page 203](#) .





## 7.5 Electro hydraulic steering box (Manufacturer Koyo) - disassemble and assemble



### Note

The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"

1 - Direction terminal of the connection rod (right side)

- Marked with "C"
- Check: ⇒ [page 300](#)
- Note the assembly position ⇒ [page 301](#)

2 - Hexagonal nut

- $50 \pm 5$  Nm

3 - Clamp

- Replace once removed

4 - Protective boot

- Must not be twisted after adjusting the alignment
- Remove the steering box to replace it

5 - Clamp

- To replace, open with pliers
- Fasten ⇒ [page 300](#)

6 - Gasket

7 - Screw

- 8 Nm

8 - Heat shield

- Only for some markets
- See: ⇒ Electronic parts catalogue "ETKA"

9 - Right track rod

- $80 \pm 8$  Nm
- Remove and install ⇒ [page 298](#)
- Supplied as a pre-adjusted replacement part
- Align the vehicle after the replacement ⇒ [page 204](#)

10 - Clamp with nuts

- Replace if threads are damaged

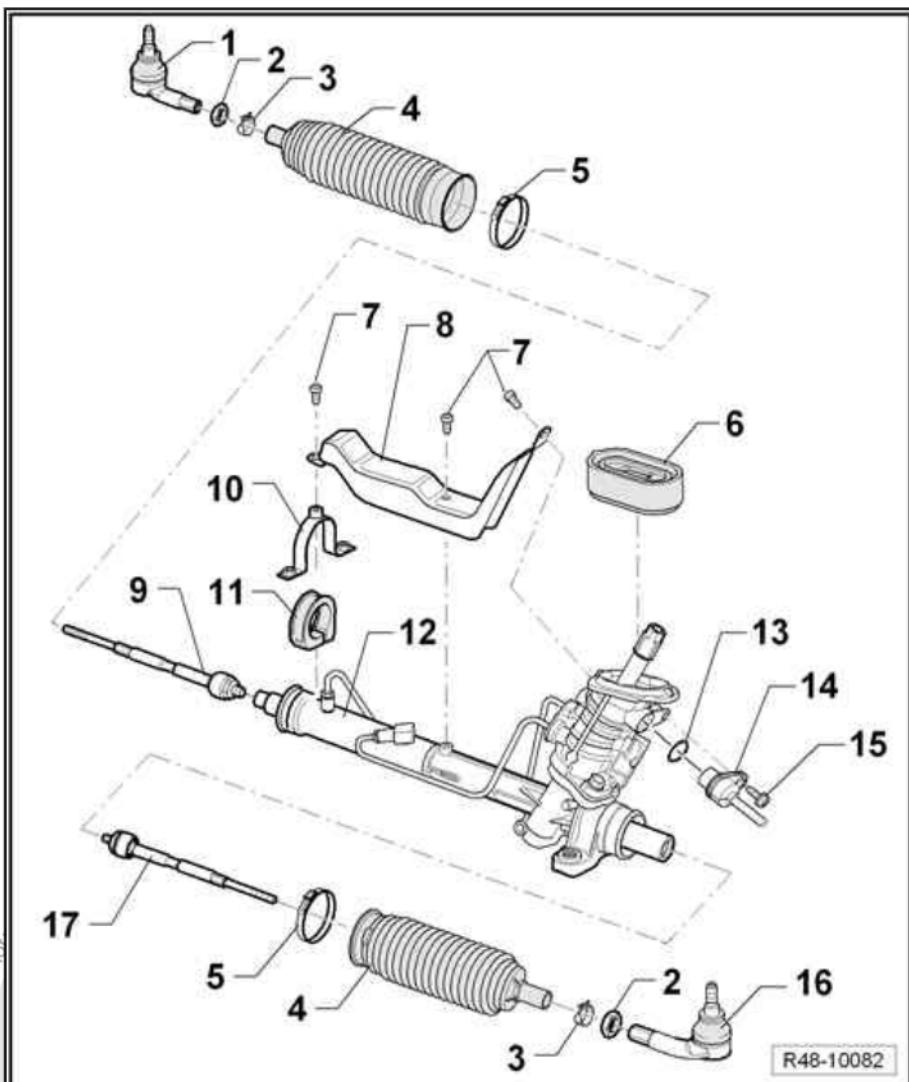
11 - Rubber bearing

12 - Steering box

- Remove and install ⇒ [page 286](#)

13 - Gasket

- Replace once removed



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14 - Electro hydraulic steering sensor - G250-

- Remove and install [page 292](#)
- Check operation with the Vehicle diagnostic, testing and information system - VAS 5051- or Vehicle diagnostic, testing and information system - VAS 5052- or later equipment [Vehicle diagnostic tester](#).

15 - Screw

- 6 Nm

16 - Track rod steering linkage (left side)

- Marked with "D"
- Check [page 300](#)
- Note the assembly position [page 301](#)

17 - Left track rod

- $80 \pm 8$  Nm
- Remove and install [page 298](#)
- Supplied as a pre-adjusted replacement part
- Check length and adjust [page 299](#)

## 7.6 Electro hydraulic steering box (TRW) - disassemble and assemble

1 - Direction terminal of the connection rod (right side)

- Marked with "C"
- Check: [page 300](#)
- Note the assembly position [page 301](#)

2 - Hexagonal nut

- $50 \pm 5$  Nm

3 - Clamp

- Replace once removed

4 - Protective boot

- Must not be twisted after adjusting the alignment
- Remove the steering box to replace it

5 - Clamp

- Replace - open with pliers
- Fasten [page 300](#)

6 - Gasket

7 - Screw

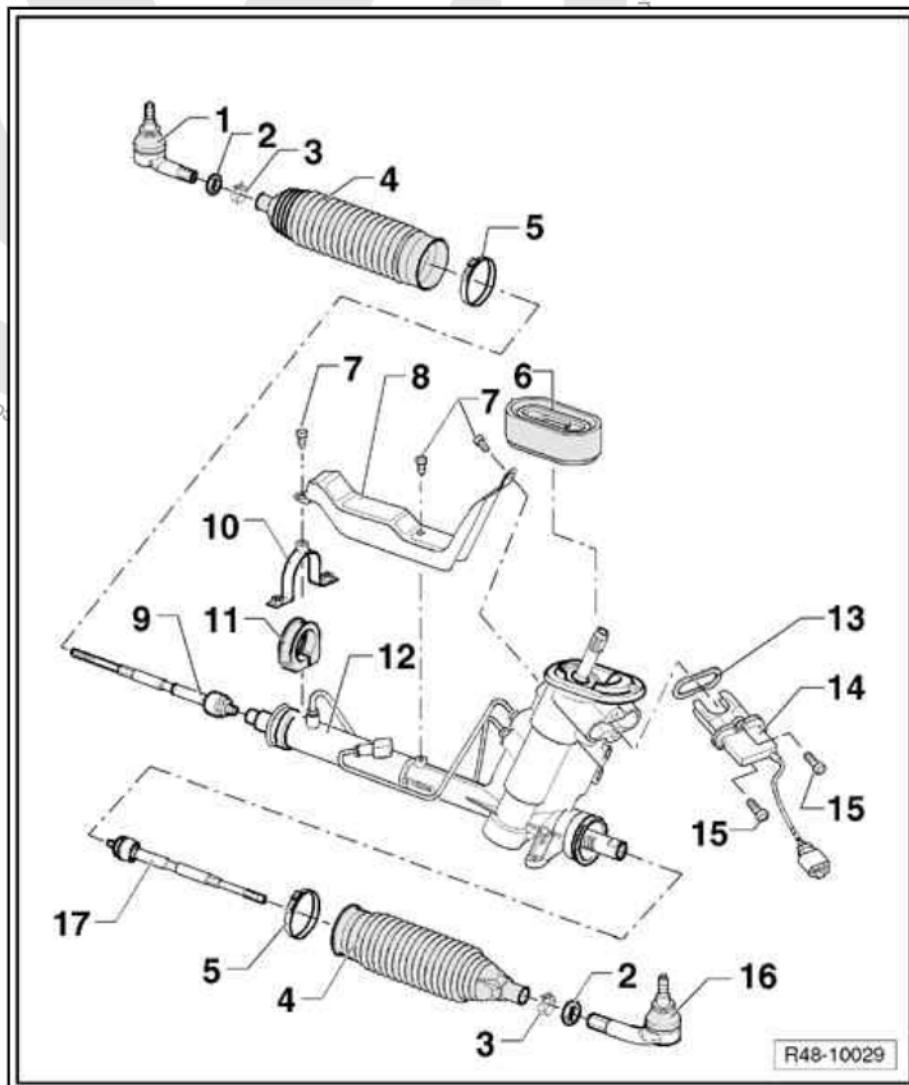
- 8 Nm

8 - Heat shield

- Only for some markets
- See: [Electronic parts catalogue "ETKA"](#)

9 - Right track rod

- $80 \pm 8$  Nm
- Remove and install [page 298](#)
- Supplied as a pre-adjusted replacement part



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- Align the vehicle after the replacement [⇒ page 204](#)
- 10 - Clamp with nuts
  - Replace if threads are damaged
- 11 - Rubber bearing
- 12 - Steering box
  - Remove and install [⇒ page 286](#)
- 13 - Gasket
  - Replace once removed
- 14 - Electro hydraulic steering sensor - G250-
  - Remove and install [⇒ page 292](#)
  - Check operation with the Vehicle diagnostic, testing and information system - VAS 5051- or Vehicle diagnostic, testing and information system - VAS 5052- or later equipment [⇒ Vehicle diagnostic tester](#).
- 15 - Screw
  - 6 Nm
- 16 - Track rod steering linkage (left side)
  - Marked with "D"
  - Check [⇒ page 300](#)
  - Note the assembly position [⇒ page 301](#)
- 17 - Left track rod
  - $80 \pm 8$  Nm
  - Remove and install [⇒ page 298](#)
  - Supplied as a pre-adjusted replacement part
  - Check length and adjust [⇒ page 299](#)



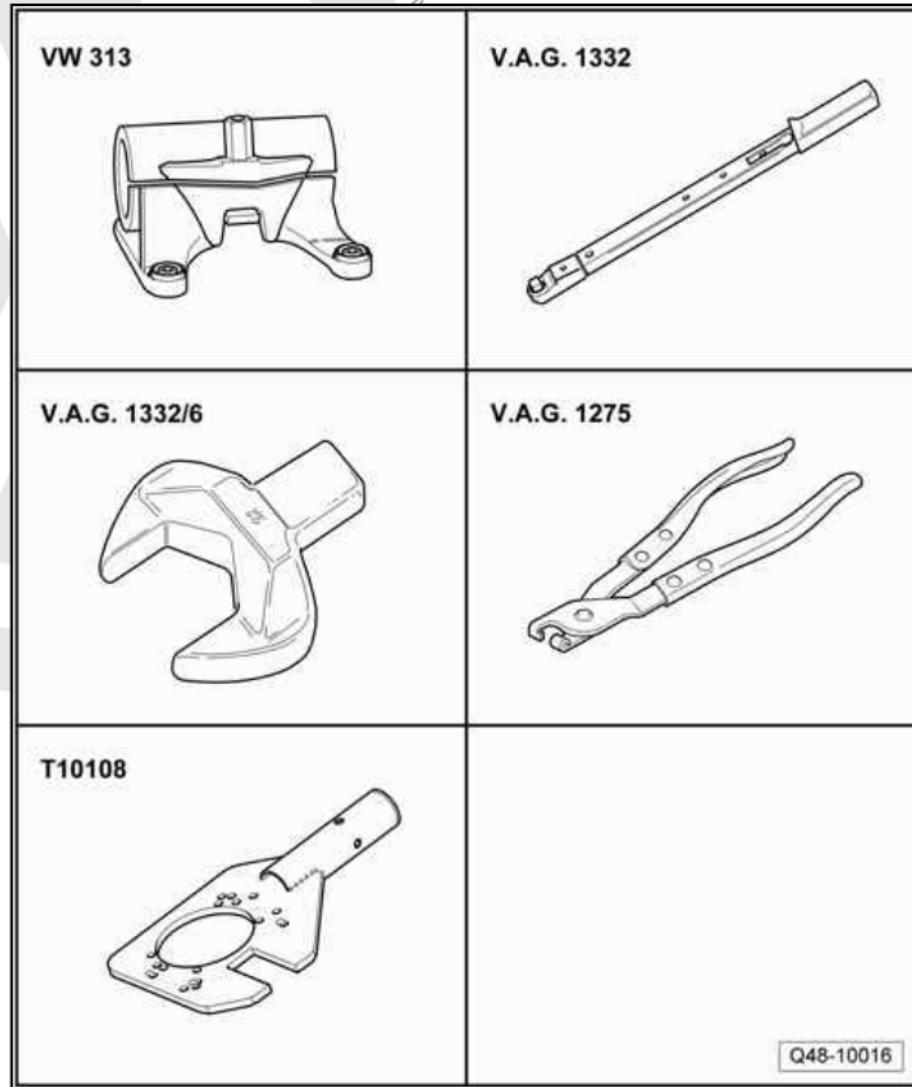
## 7.7 Track rod - remove and install



### Note

The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"

Special tools and workshop equipment required



- ◆ Support for VW 643 or VW 643/1 - VW 313-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Wrench insert 32 - VAG 1332/6-
- ◆ Clamp pliers or VW 004V - VAG 1275-
- ◆ Gearbox support - T 10108-



## 7.7.1 Removal

### Note

- ◆ The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ *Electronic Spare Parts Catalogue "ET-KA"*
- ◆ The track rods can only be removed and installed with the steering box removed.

- Close the steering box pipes if this has not been done yet.
- Clean the steering box on the outer section with the bellows.

To remove the right track rod open the left boot tightening clamp and push the boot backward because, to release the right track rod, it is necessary to press against the left gear rack.

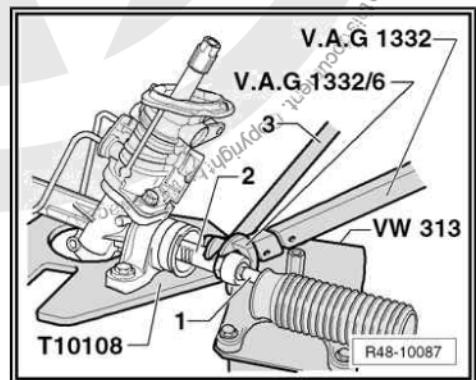
- Open the clamp with the Clamp pliers or VW 004V - VAG 1275- and move the boot backwards.

Vehicles with electro hydraulic steering (Manufacturer Koyo):

- Fasten the steering box to the Gearbox support - T10108- and loosen the track rod -1- from the rack -2-.

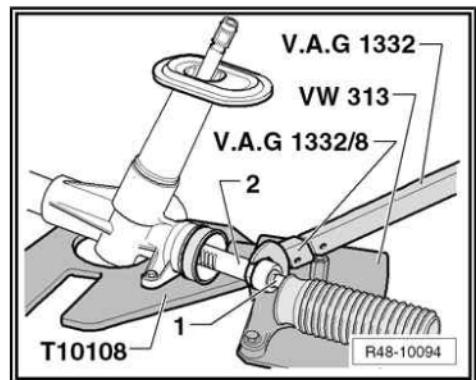
To fasten the steering box, use the hole "5" and the proper gearbox support hole, located on the front.

Vehicles with electro hydraulic steering (Manufacturer TRW):



- Fasten the steering box to the Gearbox support - T10108- and loosen the track rod -1- from the rack -2-.

To fasten the steering box, use the hole "5" and the proper gearbox support hole, located on the front.



## 7.7.2 Installation

Installation is performed in the reverse sequence to the removal.

Tightening torque:

Track rod to steering box	80 ± 8 Nm
---------------------------	-----------

## 7.8 Left track rod length - check and adjust

Special tools and workshop equipment required



- ◆ Clamp pliers or VW 004V - VAG 1275-

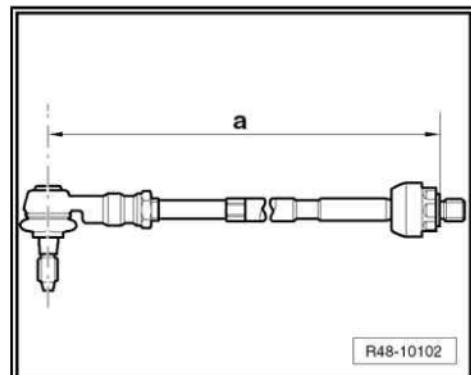


### 7.8.1 Check

- Check and, if necessary, adjust the left track rod in relation to the distance "a".

Measurement -a- =  $365 \pm 5$  mm

Then, you must check the total convergence at the wheel alignment bench, and adjust if necessary; Steering wheel alignment [⇒ page 204](#).



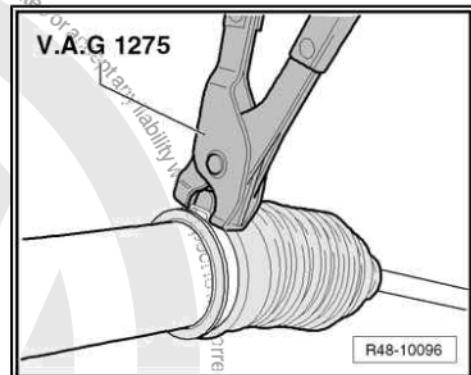
### 7.8.2 Install the protective boot

- Check the protective boot for wearing (tears, cracks) and make sure that the sealing surfaces are clean.
- When installing the protective boot, turn the track rod first so that the bar ball pin gets in the installation position.
- Fasten the clamp with the help of the Clamp pliers or VW 004V - VAG 1275-



#### Note

- ◆ Use only original clamps
- ◆ Under no circumstances shall the protective boots be installed twisted (misaligned)



### 7.9 Clearance, fastening and protective boots of track rod terminals - check

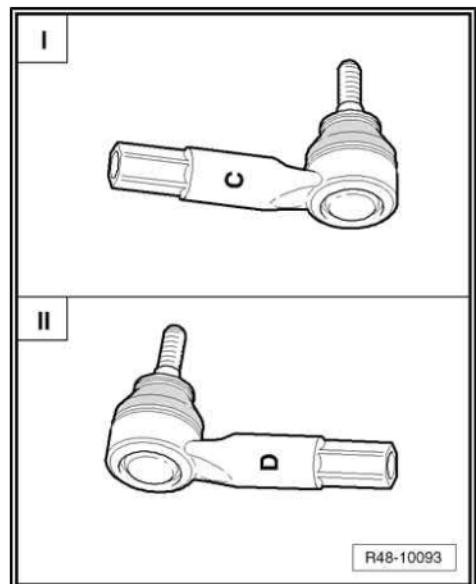
- With the vehicle raised (wheels hanging freely), check the clearance by moving the track rods and the wheels. Clearance: no clearance
- Check the fastening
- Check the sealing boots for damages and correct fitting



## 7.10 Correspondence of the track rod tips

I - Right track rod terminal is marked with -C-

II- Left track rod is marked with -D-

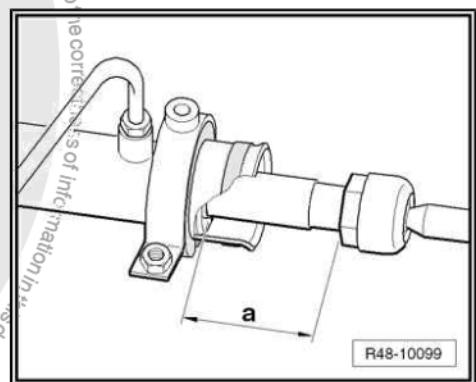


## 7.11 Centre steering rack position - determine

Before assembling the steering box, the rack must be placed at the central position.

Move the steering rack to the position where the distance -a- is reached.

Dimension -a- = 75.5 mm





## 8 Motor/pump set (Electro hydraulic steering) - repair



### WARNING

*Always replace self-locking nuts and bolts subject to angular torque*



### Note

*The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"*

### 8.1 Motor/pump set; (Manufacturer Koyo) - assembly overview



### Note

- ◆ *The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ Electronic Spare Parts Catalogue "ETKA"*
- ◆ *The motor/pump set must not be repaired*
- ◆ *For complaints, determine the cause with the help of pressure and tightness tests along with self-diagnosis*
- ◆ *If the hydraulic fluid reservoir level is low, check the steering system for leaks*
- ◆ *If leaks are found in the hose connection area, then tighten and dry them*
- ◆ *Do not reuse drained hydraulic oil*
- ◆ *Always replace the seal*
- ◆ *Oil filling capacity in the system: approx. 0.8 litres*



1 - Hexagonal bolt  
 7 Nm

2 - Rubber bearing

3 - Mounting bracket

4 - Hexagonal bolt  
 20 Nm + 90°  
 replace once removed

5 - Bushing

6 - Mounting bracket  
 for set/pump

7 - Screw  
 7 Nm

8 - Shim

9 - Cap with dipstick  
 Check the hydraulic oil level [⇒ page 312](#)

10 - Seal

11 - Motor/pump set  
 The repair is not expected  
 See: ⇒ Electronic parts catalogue "ETKA"  
 Remove and install [⇒ page 305](#)  
 Check the pressure on the motor/pump set [⇒ page 308](#)

12 - Hexagonal bolt  
 7 Nm

13 - Bushing

14 - Mounting bracket  
 for set/pump

15 - Rubber bearing

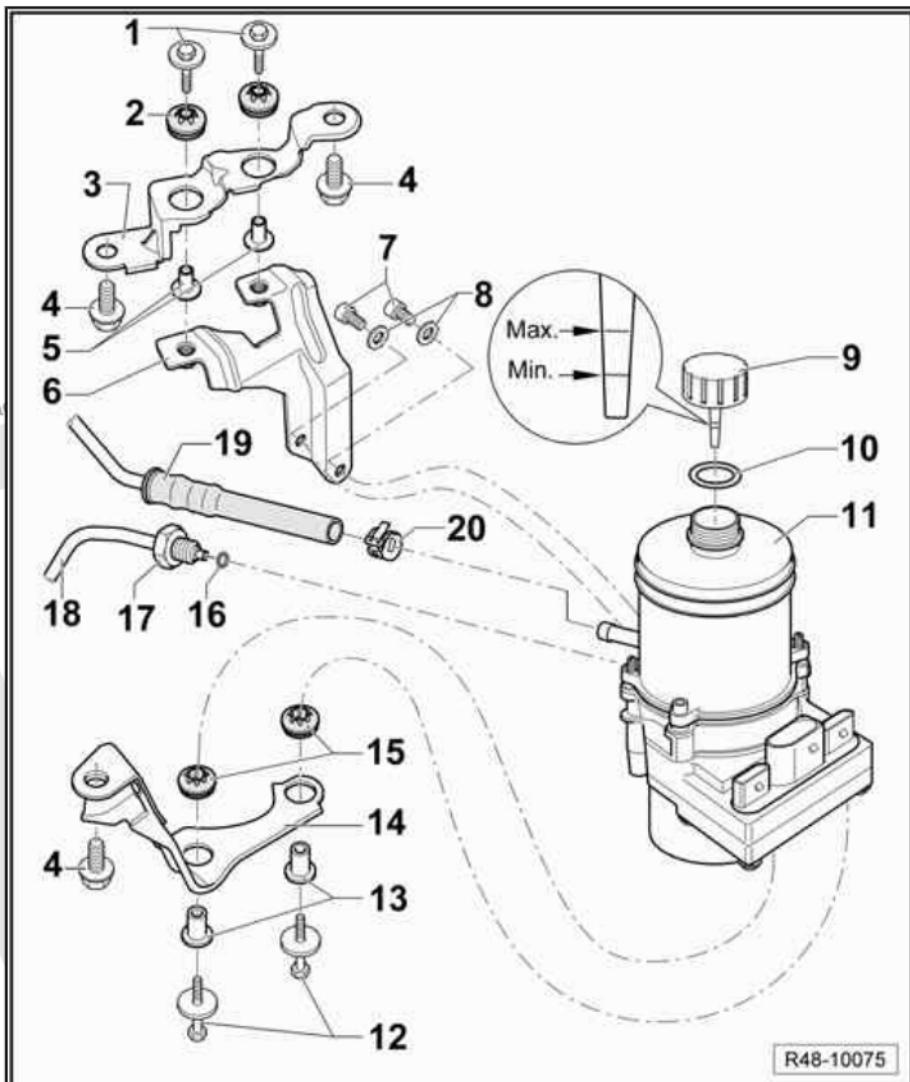
16 - Seal  
 Replace once removed

17 - Connecting screw  
 30 Nm

18 - Pressure hose

19 - Return pipe/hose

20 - Spring clamp  
 See: ⇒ Electronic parts catalogue "ETKA"





## 8.2 Motor/pump set; (Manufacturer TRW) - assembly overview

### 1 - Cap with dipstick

- Check the hydraulic oil level [⇒ page 312](#)

### 2 - Seal

### 3 - Expansion tank

- To remove from the motor/pump set, slightly heat with a hot air blower.

### 4 - Clamp

### 5 - Retainer seal

- Replace once removed

### 6 - Hexagonal nut

- 7 Nm
- By tightening properly on the support, apply counter pressure (pos. 7) [⇒ Item 7 \(page 304\)](#)

### 7 - Support

- 7 Nm
- Check if there are damages, tears to the rubber; check the metal plate released from the rubber; replace if necessary.

### 8 - Motor/pump set

- the repairs are not expected
- See: [⇒ Electronic parts catalogue "ETKA"](#)
- Only the expansion reservoir [⇒ Item 3 \(page 304\)](#), the clamp [⇒ Item 4 \(page 304\)](#) and the retainer [⇒ Item 5 \(page 304\)](#) can be replaced
- Remove and install [⇒ page 305](#)
- Check the pressure on the motor/pump set [⇒ page 308](#)

### 9 - Hexagonal bolt

- 20 Nm + 90°
- Replace once removed

### 10 - Mounting bracket

- from the motor/pump set

### 11 - Spring clamp

### 12 - Return pipe

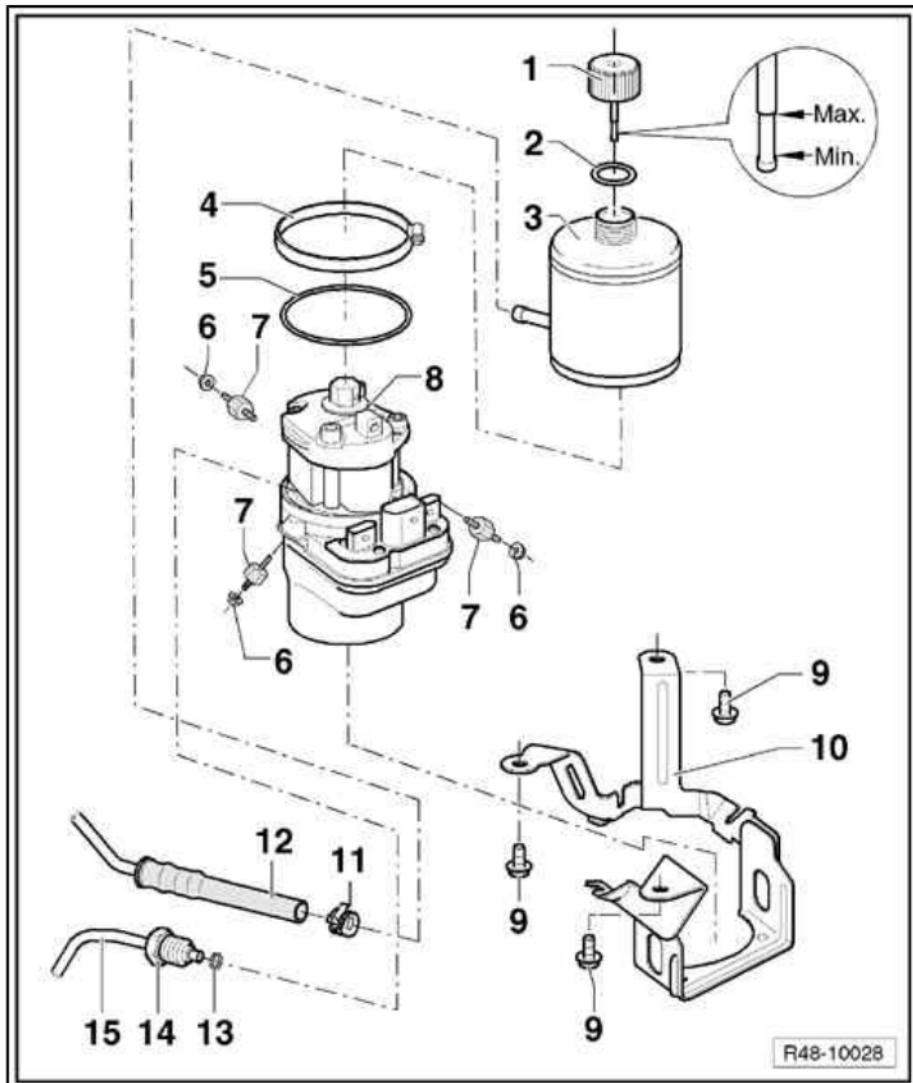
### 13 - Retainer seal

- Replace once removed

### 14 - Cap screw

- 30 Nm

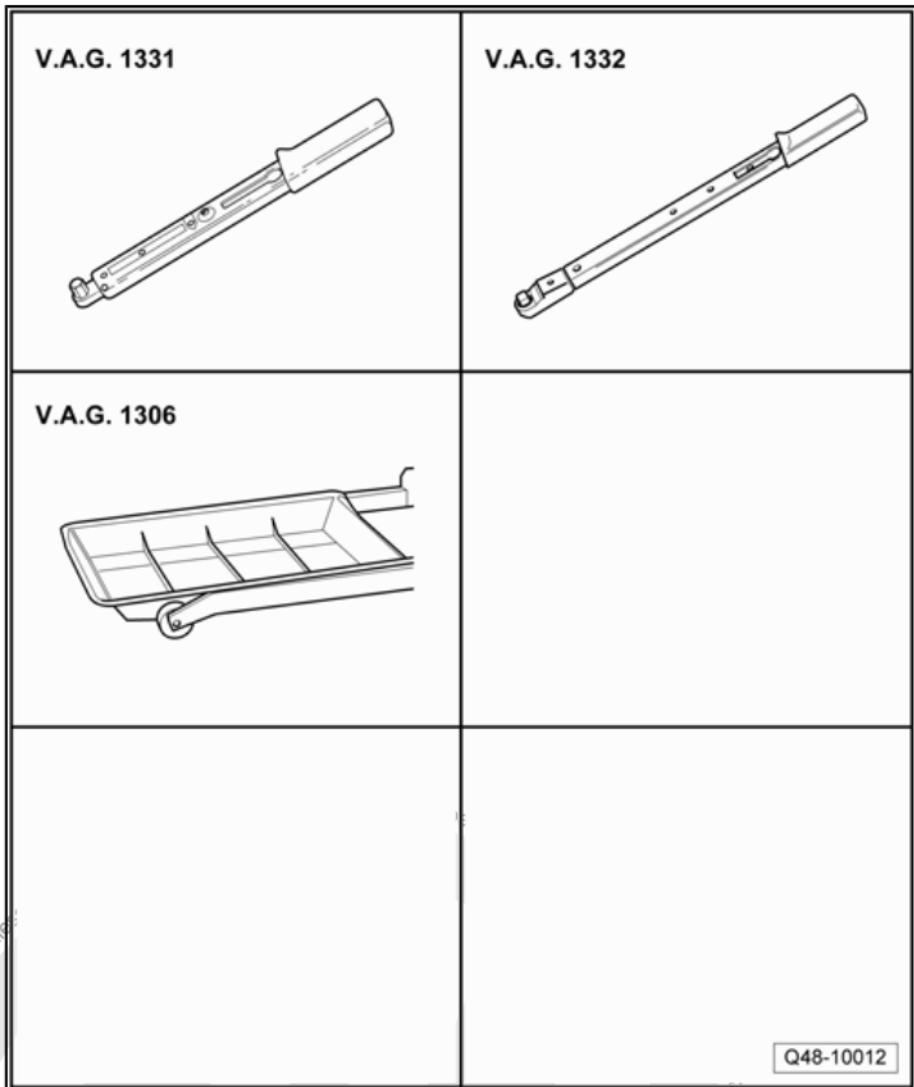
### 15 - Press tube





## 8.3 Motor/pump set - remove and install

Special tools and workshop equipment required



- ◆ "Torque wrench -5 to 50 Nm 1/2" drive) - VAG 1331-
- ◆ Torque wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Oil collecting tray, VAG 1306-

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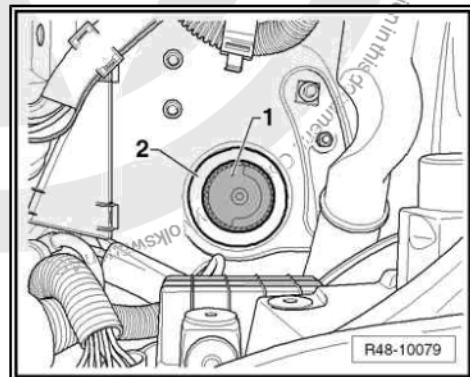


### Note

- ◆ The Koyo-brand electro-hydraulic steering is longer supplied. That is why whenever replacement is needed for any of its components, the entire Koyo set should be replaced for a full TRW set. Consult. ⇒ *Electronic Spare Parts Catalogue "ET-KA"*
- ◆ The motor/pump set must not be repaired
- ◆ For complaints, determine the cause with the help of pressure and tightness tests along with self-diagnosis
- ◆ If a fault is determined, replace the motor/pump set
- ◆ Residual hydraulic fluid remains on the motor/pump set, as well as on the pressure and return hoses, after the fluid is drained
- ◆ Do not reuse drained hydraulic oil
- ◆ The pressure and return hoses must not be tightened using, for example, Clamps (diam. 25mm) - 3094- or tools. Tightening may damage the pressure and return hoses
- ◆ To prevent damage, avoid a radius with curvature smaller than 100 mm when folding or applying pressure to pressure and return lines

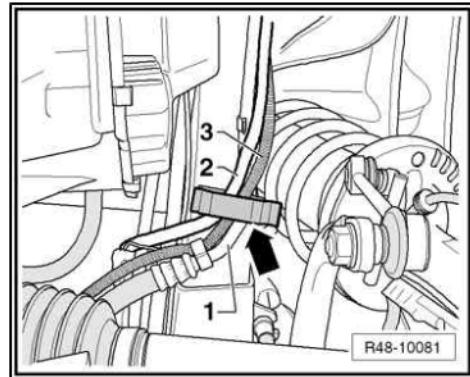
#### 8.3.1 Removal

- Disconnect the Battery - A- ⇒ *Electrical devices; Rep. gr. 27 ; Starter, alternator, battery .*
- Remove the console from the Battery - A- ⇒ *Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .*
- Remove the cover -1- from the motor/pump set -2-.
- Remove as much hydraulic oil from the engine/pump assembly as possible, with the help of a suction bottle.
- Remove the left front wheel.
- Remove the left front wheel arch cover ⇒ *Body - External assembly works; Rep. gr. 66 ; External equipment .*
- Remove the noise insulation, if any ⇒ *General body repairs, exterior; Rep. gr. 50 ; Body - front section .*



- Open the clip -arrow-.
- Remove the pressure and return hoses -1- and -2- from the clip.
- Remove the cable -3- of the Electro hydraulic steering sensor - G250- from the spacer.

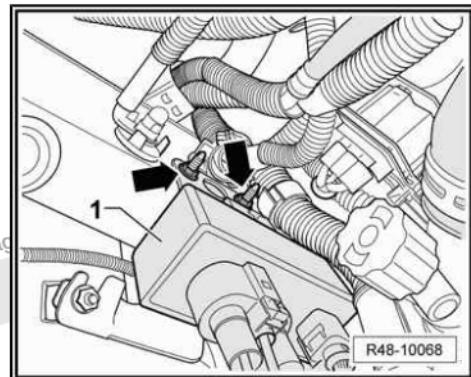
Vehicle with air-conditioning



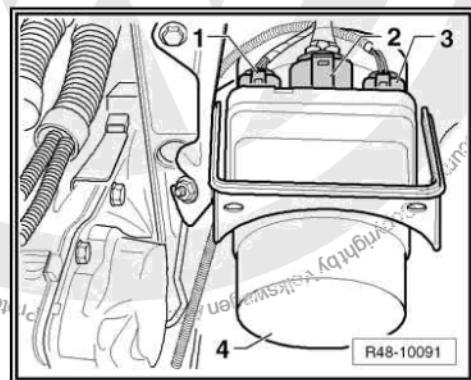
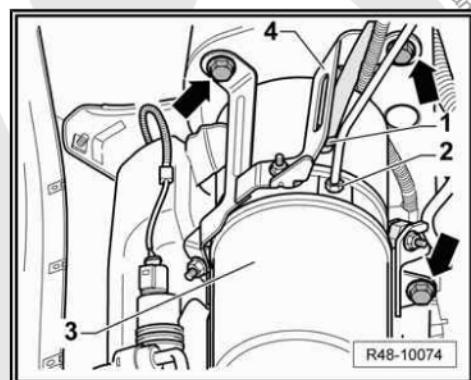


- Remove the radiator fan control unit -1- from the car body -arrows-.

Continuation for all vehicles



- Open the return hose clamp -1- and remove from the motor/pump set connection return duct.
- Remove the pressure duct -2- from the motor/pump set -3-.
- Seal the engine/pump assembly threaded holes with plastic plugs, for example.
- Seal the pressure hose, the return hose and the connections on the motor/pump set with plastic bag and adhesive tape.
- Remove the screws -arrows- and slightly lower the motor/pump assembly with the support.
- Disconnect the connectors -1-, -2- and -3- from the motor/pump set -4-.
- Remove the motor/pump set along with the support.



### 8.3.2 Installation



- ◆ Use new seal for the duct/hose connections
- ◆ Make sure that the sealing surfaces are clean

Installation is performed in reverse sequence to the removal.

- Fill with new hydraulic oil using a hose with approximately 400...500 mm in length and a funnel.

Use Hydraulic oil - G 004 000 M2-. See the ⇒ Chemicals Manual

- Bleed the steering system ⇒ [page 310](#) .
- Check the hydraulic oil level ⇒ [page 312](#) .

Tightening torques:

Motor/pump assembly support to body ⇒ [Item 4 \(page 303\)](#) .

Pressure hose to motor/pump assembly ⇒ [Item 17 \(page 303\)](#) .



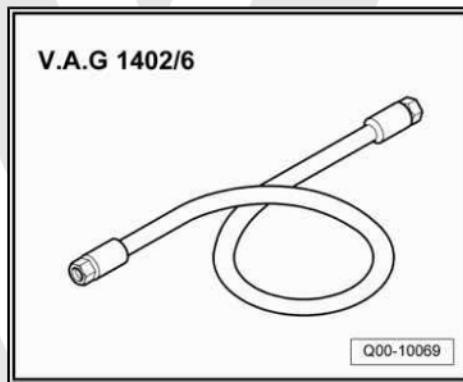
## 8.4 Motor/pump set pressure (Koyo / TRW) - check

Special tools and workshop equipment required

- ◆ Control equipment for power steering - VAG 1402-



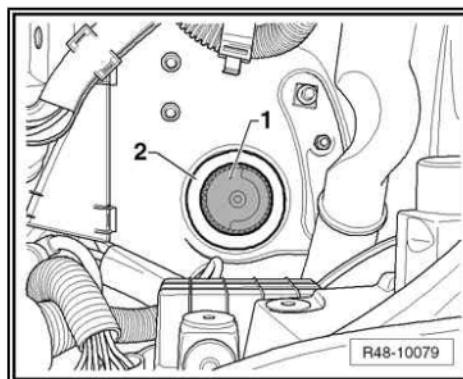
- ◆ Adapter - VAG 1402/6-



- ◆ Adapter - VAG 1402/13-

- ◆ Adapter - VAG 1402/14-

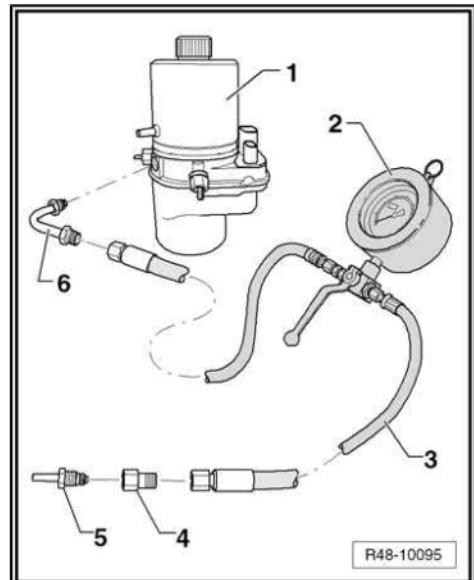
- Disconnect the Eatery - A- and remove the console from the Battery - A- ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- Remove the cover -1- from the motor/pump set -2-.
- Remove as much hydraulic oil from the pump as possible, with the help of a suction bottle.
- Remove the engine noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .
- Disconnect only the pressure tubes from the motor/pump assembly.





- Assemble the adapters as indicated in the illustration.

- 1 - Motor/pump set
- 2 - Power steering control equipment - VAG 1402-
- 3 - Adapter - VAG 1402/6-
- 4 - Adapter - VAG 1402/14-
- 5 - Press tube
- 6 - Adapter - VAG 1402/13-



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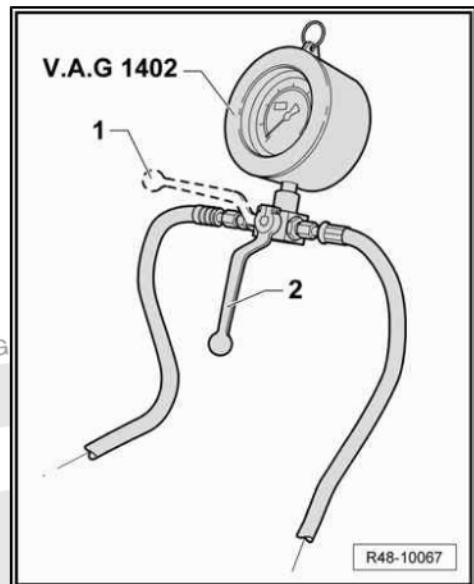
#### Note

*Pay attention to the pressure gauge handle position, because it must be on the position -2-*

- Fill with hydraulic fluid and check the level [⇒ page 312](#) .
- Bleed the steering system [⇒ page 310](#) .
- Test the distribution pressure now.

Checking condition:

- System tightness
- The flexible tubes/cables must not be bent or strangled.
- Start the engine.
- Turn the steering wheel completely to one side.



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- With the idle engine, close the tap for a maximum period of 5 seconds (position -1-) and read the pressure.

Nominal pressure value:

90...105 bar

If the nominal value is not reached, replace the motor/pump set [⇒ page 305](#).

Completely turn the steering by the steering wheel until the stop and immobilize it. With the blocking valve in the position -2-, read the pressure.

If the value read is clearly lower than the first one, there is a leak in the steering box.

- Disassemble the pressure gauge and the adapter.
- Install the pressure tubes to motor/pump set.
- Fill with hydraulic fluid and check the level [⇒ page 312](#).
- Bleed the steering system [⇒ page 310](#).
- Check the hydraulic fluid level and replenish, if necessary [⇒ page 312](#).
- Test the steering system tightness [⇒ page 311](#).
- Install the engine noise insulation, if any ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .

#### Tightening torques:

Pressure tube to the motor/pump assembly

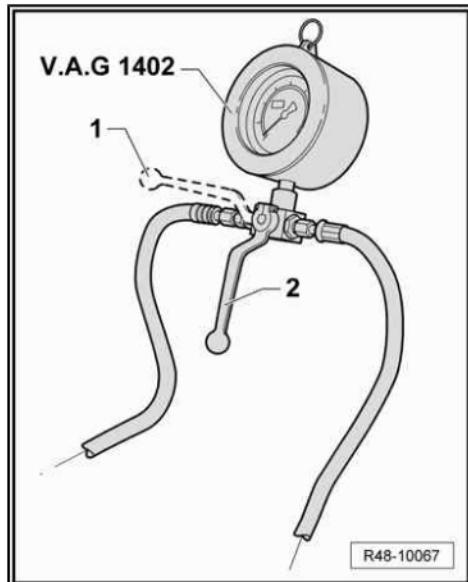
9)

30 Nm

9) Use new retainer.

## 8.5 Steering system - bleed

- Remove the left front wheel.
- Remove the left front wheel arch cover ⇒ Body - External assembly works; Rep. gr. 66 ; External equipment .
- Check the hydraulic oil level and replenish, if necessary [⇒ page 312](#).
- Lift the vehicle until the wheels turn freely.
- Turn the steering wheel from stop to stop 10 times, with the engine stopped.
- Check the hydraulic oil level and replenish, if necessary [⇒ page 312](#).
- Loosen the hydraulic oil reservoir lid. Do not tighten.
- Let the engine running for 10 seconds, then turn it off.
- Check the hydraulic oil level and replenish, if necessary [⇒ page 312](#).
- Loosen the hydraulic oil reservoir lid. Do not tighten.
- Repeat the work sequence described until the hydraulic oil level no longer lowers:
- Run the engine.
- Turn the steering wheel 10 times from stop to stop.
- Switch the engine off.





- Check the hydraulic oil level and replenish, if necessary  
⇒ [page 312](#).
- After the bleeding procedure is concluded, tighten the motor/pump set reservoir lid manually.

## 8.6 Steering system tightness - check



*If, even after the repair, the hydraulic oil level in the reservoir is low, it is mandatory to check the electro hydraulic steering system for leaking*

- Remove the left front wheel.
- Remove the noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front section .
- Remove the left front wheel arch cover ⇒ Body - External assembly works; Rep. gr. 66 ; External equipment .
- Run the engine at idling speed.
- Turn the steering wheel to both sides until the "stops". Keep the steering wheel in this position for 5 to 10 seconds each side. The maximum pressure possible will be produced.
- Check the pressure and return tubes for tightness.
- Check all tubes and hose connections for fitting and tightness. When the pipes and hoses are leaking, tighten the connections to the prescribed torque or replace the seal or the pipe/hose.
- Check the motor/pump set for tightness. Replace in case of leaking.
- Check the hydraulic oil reservoir for tightness. On vehicles with a Koyo motor/pump set, if the reservoir leaks, the motor/pump set must be replaced.
- Check the hydraulic fluid level and replenish, if necessary  
⇒ [page 312](#).



*If the hydraulic oil level in the reservoir lowers even if the pipes/hoses and/or pressure duct connections have no leaks, the electro hydraulic steering box may be the cause for the hydraulic oil loss. In this case, the electro hydraulic steering box must be checked, after being removed from the vehicle*

- Remove the electro hydraulic steering box ⇒ [page 286](#).

Check the following parts for leaks with the steering box removed:

- ◆ Steering box valve body pinion seal
- ◆ All connections from the steering box tubes

For next steps, put the protective boots away:

- Open the protective boot clamps.
- Push the protective boot away. The steering box must be replaced if the hydraulic oil is visible on the steering box body and/or on the protective boot.
- Install the electro hydraulic steering box ⇒ [page 290](#).



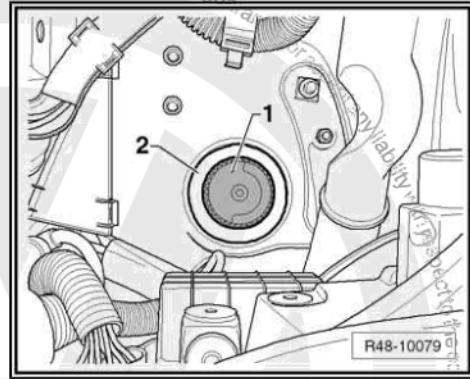
- Install the left front wheel arch cover ⇒ General body repairs, exterior; Rep. gr. 66 ; External equipment .
- Install the front wheel and tighten the bolts [⇒ page 203](#) .

## 8.7 Oil level - check

- Disassemble the air filter case if necessary.
- Remove the Battery - A- and its console ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- Remove the reservoir lid -1- from the motor/pump set-2-.
- Clean the oil dipstick with a clean, lint-free cloth.
- Tighten the lid manually, loosen again and check the oil level.

The cap must be fully screwed on in order to obtain an accurate oil level reading.

- Do not start the engine and leave the wheels in straight line position.



- Check the oil level.

The oil level must lie between the lower mark -arrow A- and the higher mark -arrow B- on the oil dipstick.



### Note

- ◆ If the oil level is above the mark -arrow B-, the excess fluid must be drained
- ◆ If the oil level is below the area indicated, the hydraulic system must be checked for leaks (check the electro hydraulic steering system tightness [⇒ page 311](#) ). It is not enough to simply replenish the oil level
- ◆ Do not reuse the hydraulic oil after draining it
- ◆ Use Hydraulic Oil - G 004 000 M2- to replenish. Refer to the [⇒ Chemicals Manual](#)

- If it is proven that the hydraulic system does not have leaks, you must replenish the hydraulic oil level.
- Tighten the motor/pump set reservoir lid manually.

